Amended in November 2013

REQUEST FOR PROJECT/PROGRAMME
FUNDING FROM THE ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to:

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN P4-400
Washington, D.C., 20433
U.S.A
Fax: +1 (202) 522-3240/5
Email: afbsec@adaptation-fund.org

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

PART I : PROJECT/PROGRAMME INFORMATION

PROJECT/PROGRAMME CATEGORY	: SMALL-SIZED PROJECT/PROGRAMME
COUNTRY/IES	: INDONESIA
TITLE OF PROJECT/PROGRAMME	: **ENHANCING THE ADAPTATION CAPABILITY OF COASTAL COMMUNITY IN FACING THE IMPACTS OF CLIMATE CHANGE IN *NEGERI* (VILLAGE) ASILULU, URENG AND LIMA OF LEIHITU DISTRICT MALUKU TENGAH REGENCY MALUKU PROVINCE**
TYPE OF IMPLEMENTING ENTITY	: NATIONAL IMPLEMENTING ENTITY
IMPLEMENTING ENTITY	: KEMITRAAN (PARTNERSHIP GOVERNANCE REFORM)
EXECUTING ENTITY/IES	: HARMONY ALAM INDONESIA FOUNDATION
AMOUNT OF FINANCING REQUESTED	: **USD 963.455,31**

PROGRAMME BACKGROUND AND CONTEXT

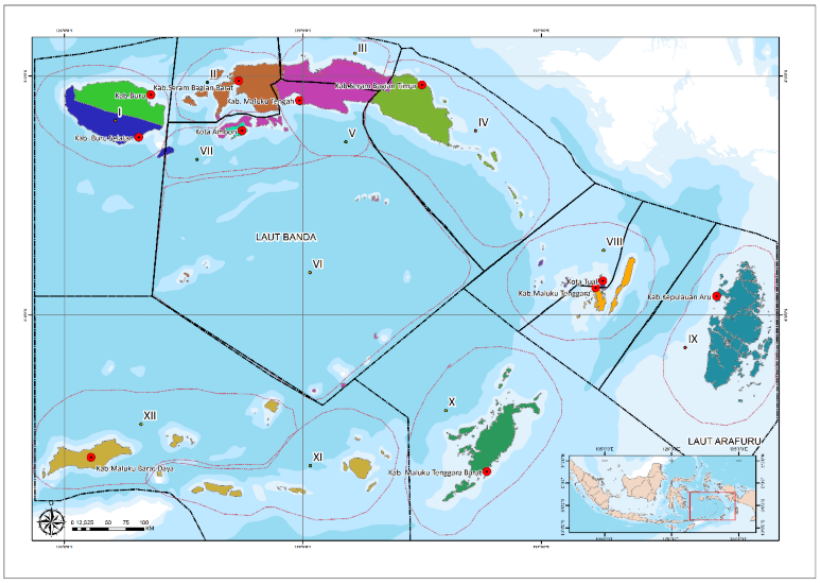
1. In the technical summary, *Intergovernmental Panel on Climate Change*- IPCC (2007) states that, due to global warming, there are two factors that affect the prone coastal ecology social system. First, global warming causes climate change that escalates the likelihood of storms in coastal regions. In 1905 – 1930, there was approximately six tropical storms on Atlantic bay, yearly. The yearly average nearly doubled (10 times of tropical storm in a year) in 1931-1994 and tripled (15 times of tropical storm) between the period of 1995 and 2005. In 2006, however, there had been 10 cases of tropical storm, despite of the year being known as “the calm year". This intensifying pattern of tropical storms will continue for as long as the global warming occurs. Two, it is predicted that global warming would raise sea water temperature between 1 – 3 °C. From biological standpoint, this occurrence instigates a surge of coral reef death and coral bleaching in the tropical waters. Indonesia, as a nation with more than 17.000 islands and 80.000 kilometers of shoreline, is under the threat of ever-rising of sea surface level. An increase of as small as 1 meter in sea level would submerge 405.000 hectare coastal region and 2.000 islands, as well as coral reefs surrounding the sea level (UNDP, 2007).
2. Global warming disrupts global climate system and is the main factor contributing to the frequency and intensity of extreme climate. It triggers a series of disaster in Indonesia. In accordance to the report of Indonesian National Board for Disaster Management (BNPB), 98% of 2.341 disasters taking place in 2017 are hydrometeorology disasters, such as: flood, tornadoes, tidal waves, avalanches, droughts, forest fires and land fires. Economic loss from these disasters is approximated up to IDR 30 trillion per year.
3. Climate change severely limits the choice of livelihoods, making life unpredictable due to the instability resulted from climate change (Rozenweig & Parry, 1994; Yohe & Tol, 2002). Coastal communities has to face challenges from climate change and the multidimensional impacts the climate change could cause will only aggravate their situation. Environmental and political-economic changes are making more and more coastal communities vulnerable (Howden et al. 2007; IPCC, 2007). Collectively speaking, thousands of household in coastal region could become impoverished due to damages occuring on infrastructure, settlement,

and daily facilities, poverty, and marginalization experienced by the coastal communities throughout the history, which is expected to be more intense every year from the impact of climate change[1].

Effects of Climate Change in Maluku Province

4. Maluku Province is an archipelagic province comprising 1,412 islands with a total coast line of 11 thousand kilometers, and total area of 712,480 km^2, where 92.4% of it is seas and only 7.6% is land. The total population of Maluku Province in 2016 reached 1,715,548 people with gender ratio of 101.77 which means that for every 100 females, there are 102 males. The majority of Maluku communities (80%) live in coastal areas and for generations they are depending on the fishery and marine sector, especially capture fishery. One of the prime commodities in the capture fishery sector in Maluku is tuna. In the Long-term Development Plan (RPJP) of Maluku Province of 2005 – 2025, the Government of Maluku Province focuses the sustainability-based regional development on the functions of archipelagic ecosystem[2].
5. One of approaches for implementing development in Maluku Province is a regional approach based on Gugus Pulau concept of a total 12 Gugus Pulau (Picture 1) with growth centers acting as public service center, trading center, distribution center, and services center.

Picture 1. Maluku Province Map According to City/District and Gugus Pulau Distribution



Source: Spatial Planning (RTRW) of Maluku Province 2013-2033

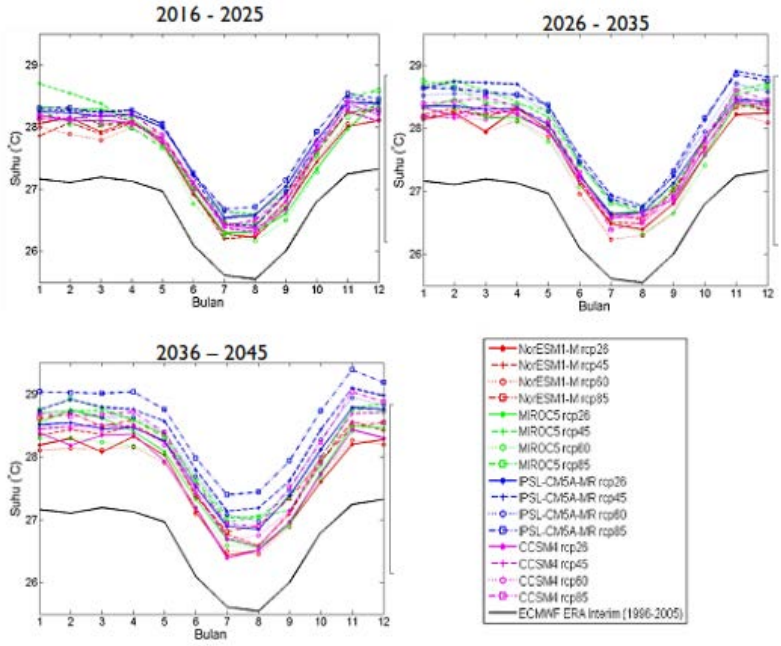
6. Future projection of average temperature changes in Maluku, indicated in the downscaling statistics from IPCC Global Climate Model as carried out by Gede Junnaedhi and Joko

[1] Subair., Lala M. Kolopaking., Soeryo Adibiwobo., & Bambang Pranowo., 2014. In Community Journal Entitled *Adaptasi perubahan Iklim Komunitas Desa: Studi Kasus di Kawasan Pesisir Utara Pulau Ambon*; Hal 58.

[2] Road Map of Climate Change Mitigation and Adaptation and Sustainable Development in Maluku Province (road map MAPI), Directorate General of Climate Change Control Ministry of Environment and Forestry and Government of Maluku Province, 2017, p. 26.

Trilaksono in 2017, shows an increase of temperature from 0,5 ºC to 1,5ºC. This projection is calculated using green house moderate gas emission scenario, which is RCP 4.5. This screnario is also used by BMKG because it is considered moderate and suitable with emission level in Indonesia. Average yearly projection graphic in 2025 shows an increase in minimum temperature, which is a sign that Maluku has undergone climate change. This trend rises in 2026-2035 which shows that there is an even higher chance of drought in dry season and rain in rainy season. Furthermore, climate change in Maluku region can be observed from the predicted rising temperature in the period of 2036-2045. This influences the potential of high-risk natural disasters, such as flood in several regions of Maluku [3]

Picture 2. Projection of Average Temperate Value in Maluku Province.



Source: USAID APIK Research Report on Maluku Province Vulnerability, 2018.

7. The Regional Development Planning Agency of Maluku has identified several factors in these aspects as challenges to the adaptation efforts, among others: (1) Varied perceptions on climate change and competing priorities of the government and individuals; (2) relatively weak institutional framework of the government; (3) weak social and economic condition of the communities; (4) availability pf capacity and good government in the region.
8. Fishery is one of the sectors contributing the most income for Maluku's economy. It is, however, one that is most impacted by climate change. According to the data from fishery statistical report of Maluku Province, most fishing cacth in Maluku Province comes from aquacultur and offshore fishing yield, which result in 586,106 tons and 551,812 tons respectively, in 2013 (Maluku Province Office of Fisheries, 2016)

[3] USAID Projection of Average Temperate Value in Maluku Province (APIK). 2018. Research Report on Maluku Province Vulnerability, Page 15.

9. One of the most important commodities of Maluku in the capture fishery sector is tuna. In economic terms, the sale of tuna ranks the second (Rp2.6 billion) after scad (Rp3.8 billion). At the provincial level, tuna is the most exported fish throughout 2016 amounting to 1,115.21 tons. most exported fish throughout 2016 amounting to 1,115.21 tons. Meanwhile, frozen grouper ranks the third with the number of catches amounting to 8.86 tons in the last 2016. Behind such enormous potential, the results of vulnerability review workshop in 2017 indicate that Maluku Tengah, Maluku Tenggara, and Maluku Barat Daya Regencies as well as Tual City have an extremely high vulnerability in the capture fishery sector. This situation is understandable because the region has an extremely vast sea area and greatly depends on products in the capture fishery sector, while most fishermen in this region still fish traditionally and conventionally.
10. Vulnerability in maritime and fishery sectors related to the cause of climate change can be observed from the rising temperature and sea surface caused by coastal circulation pattern change, thus affecting nutrient supply, coastal erosion, sea acidity, and coral bleaching. This condition impacts ecology processes that is directly related to coral reef growth and spawning cycle of coral fish and other invertebrates. Fisheries are dependent on coastal region ecosystem. Unpredictable weather and high frequency of cyclone directly affect fishermen's productivity and their operational system. This condition means less fish in markets and loss of income experienced by traditional fishermen.

Table 1. The Effects of Climate Change in Maritime and Fishery Sectors

***Stressor* Climates**	**Direct Effects**	**Effects**
The Rise of Temperature and Sea Level	1. Coral bleaching and lack of growth (changes in waters composition and depth) 2. Disturbed re-spawn cycle 3. Immigrating fish	1. Declining agricultural yields 2. Declining marine yields 3. Less income for fishermen 4. Negatively-affected coastal communities and aggravated ecosystem
The Rising of Sea Level Surface	1. Less pond area 2. Damaged coral reefs 3. Less marine yields 4. Coastal flooding occurrence	1. Low pond productivity 2. Poor economy for fishermen 3. Damaged infrastructure
Typhoon	1. Less fishing activities 2. Less agricultural activities	Marine product in decline
Seawater acidity	1. Less marine yields 2. Damaged coral reefs 3. Less microbial shift 4. Eutrophication	1. Less income for fishermen 2. Disrupted economy for fishermen 3. More fertile waters for seaweed

Source: The Results of APIK Vulnerability Report Workshop, 2017

11. Vulnerability aspects of the availability of drinking water consist of 5 types namely; (1) rainwater, (2) groundwater, (3) surface water, (4) desalination water, and (5) imported (bottled) drinking water. In the Maluku islands, not all sources of drinking water can be

easily accessed and available on most islands. As a result, most people are very vulnerable to natural variability in rainfall patterns or changes in tropical cyclone patterns.

12. Vulnerability of socio-economic aspects of culture and governance. Bappeda Maluku identified several factors in this aspect as a challenge factor for adaptation efforts, including: (1) Different perceptions of climate change and priority competition between government and individuals; (2) Government institutional framework which is still relatively weak; (3) Weak social and economic conditions; (4) the availability of capacity and good governance in the regions.

Site Project/Programme

13. Central Maluku consists of small islands vulnerable to even the smallest of ecological changes. As an archipelago, this area greatly depends on the ocean; both as source of living and connecting route between areas. Coastal area and the sea holds a significant function and role on the situation and condition of the surrounding areas, which greatly influences the lives and economy of the community. Weather and seasons are among the factors influencing tidal range, ocean current strength, and wind speed—which in turns influence people's ability in earning money and their mobility.
14. Change in fish season also impacts on fishermen's catch and also on material losses because of the relatively high cost for going to sea due to the requirement to move continuously for catching up with time and fishing ground, while catch sometimes does not meet the target. The occurrence of El Nino and La Nina phenomenon results in the change in sea level temperature thus changing fish life pattern and fish migration[4]. Change in temperature will affect the decrease in fish upwelling zone (place for foraging), shift of fish population to colder or hotter sea and increase in sea wave. Coastal and sea climate change and diversity impact on the uncertainty of time and fishing ground for fishermen[5].
15. Inflation measurement by BPS was made in 2 Cities, namely Ambon City and Tual City. Inflation in Maluku for 2014 – 2017 is increasingly controlled and decreases until 2017 which constitutes the lowest inflation in Indonesia, namely 0.78%. Inflation is controlled because of intensive coordination by the Regional Inflation Control Team (TPID) and support from Maluku representative office of Bank Indonesia. Some factors which make a great contribution to inflation originate from the foodstuff group such as fresh vegetables and fish as well as transportation. One of the causes for disrupted food distribution and production which cause inflation is the factor of climate and weather along 2017[6]
16. This project is aimed at assisting coastal communities in Maluku Tengah Regency to improve their resilience and reduce their vulnerability in the social, economic and ecological aspects from the threats of climate change impacts. Specifically, this project would assist several *Negeri* (villages) in Maluku Tengah, namely Asilulu, Ureng, and Lima, which are administratively located in Leihitu Sub-District. The three negeri more or less have similar characteristics in terms of livelihood and geographical as well as ecological conditions in coastal areas. They even tend to have the same topography namely plains and hills from 0 – 700 M above sea level. Below is the table of social, environmental, and developmental conditions in the 3 Negeri.

[4] Fish migration constitutes a link of life cycle for fish to determine their habitat with a condition appropriate for the continuity of fish life stages.

[5] Dirjen PPI of KLHK and Pemprov of Maluku, Working Paper Road Map Mitigasi dan Adaptasi Perubahan Iklim dan Pembangunan Berkelanjutan Provinsi Maluku, 2017, p. 41-42

[6] Dirjen PPI of KLHK and Pemprov of Maluku, Working Paper Road Map Mitigasi dan Adaptasi.., p.16

Picture 3. Leihitu Sub-District Map, Maluku Tengah Regency

Source: BPS of Maluku Tengah Regency, Kecamatan Leihitu Dalam Angka 2018.

Table 2. Demographic Data of *Negeri* Asilulu, *Negeri* Ureng, and *Negeri* Lima[7]

Monograph Data	**Asilulu**	**Ureng**	**Lima**
Number of Population	**5,857 people**	**4,723 people**	**5,198 people**
- **Number of Family Heads**	**1,187 Family Heads**	**1,094 Family Heads**	**927 Family Heads**
- **Males**	**2,941**	**2,389**	**2,675**
- **Females**	**2,916**	**2,334**	**2,523**
Main Livelihood	**Fishermen & Fishery Labor**	**Farmers & Fishermen**	**Farmers & Fishermen**
- **Number of Fisherman Fleets**	**128 Units**	**119 Units**	**30 Units**
- Agricultural Commodities	Tubers, corn, and vegetables		
- Forestry Commodities	Sago, durian, *lansat*		
- Plantation Commodities	Coffee, Walnuts, cloves, nutmeg, and coconuts		
Social Facilities			
- Medical Facilities	2 Units	3 Units	2 Units
- Educational Facilities	7 Units	7 Units	5 Units
- Religious Facilities	6 Units	5 Units	6 Units

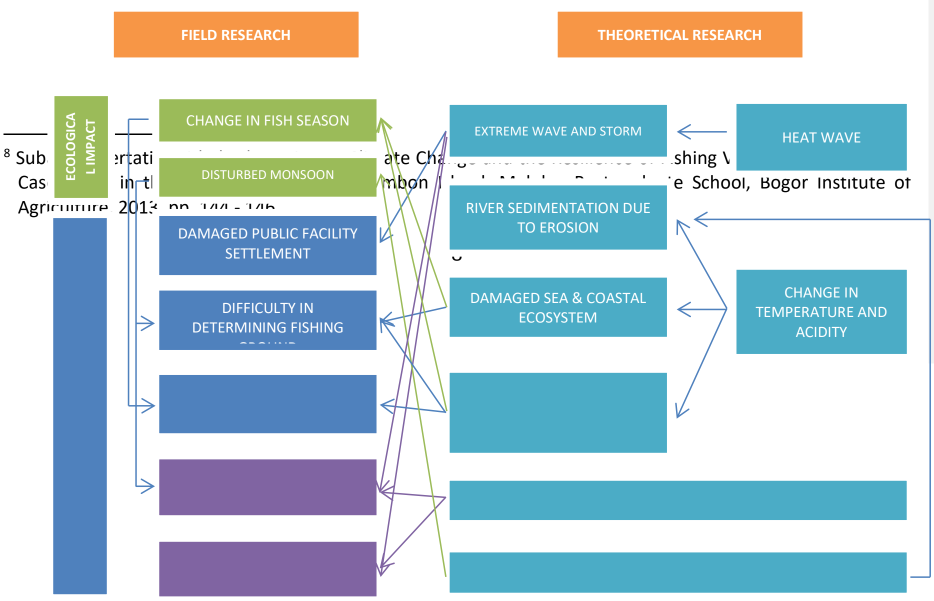
[7] BPS of Maluku Tengah Regency, *Kecamatan Leihitu Dalam Angka 2018*.

Geography			
- Regional Area of *Negeri*	± 19 KM^2	± 16 KM^2	± 19 KM^2
- Length of Coastline	± 20.49 KM	± 19.33 KM	± 6.97 KM

The selection of those three villages as the project location is supported by the results of a research on vulnerability made by Subair (2013) stating that climate change has significant impacts on villages on the north coast of Ambon island, specifically impacts in the social, economic and ecological context[8]. This region generally has two seasons in a year namely east and west seasons. In the rainy season from May to October, the East wind blows, while in the dry season from November to April, the west wind blows, and it generally occurs in Ambon island. Climate and environment in the three Negeri are roughly the same, because they are still located in a single coastline. Like other negeri in Ambon Island, the three Negeri has a temperate climate with temperature ranging between 24^o - 37^o.

17. Several socio-economic impacts of climate change on fishermen according to the results of the research by Subair (2013) include the increase of sea water level reaching settlement areas, the intensity of storm and high waves posing dangers to navigation, unpredictable changes in fish harvesting seasons, unpredictable shifts of fish seasons, confusion due to the fact that west monsoon and east monsoon are no longer in accordance with the monsoon calendar used as reference. Socio-economic impacts caused by the aforementioned condition include, among others: (1) vulnerability of settlements to damage caused by being hit by waves and strong storm wind; (2) decreasing fish catch due to the changes in fishing seasons and relocation of fishing ground.
18. Ecological impact in the form of damage to road infrastructure and breakwater walls frequently occurred along the coastal areas from Ambon city to Asilulu village. Asphalt paving had disappeared from the road surface and puddles of sea occurred on several spots on the road, while many parts of breakwater walls had gone and some parts were frequently inundated by sea water. Another impact affecting the communities, which was deemed as a disaster, was frequent occurrence of strong wind along with high waves, as frequently occurred in 2010. Another ecological impact recorded is the loss of coastal plants, including large trees that had been washed out by the sea. In addition, Fishermen who are affected by the increase of sea water level also realize that currently sea water has reached the backyards of some of their houses and is inundating the beach that is used to be used as the pace for mooring (drying) their boats.

Figure 4. **Interrelationships between changes in socio-economic and ecological contexts**



[8] Sub… …ertati… …ate Cha… …shing V… Cas… in th… …mbon … …e School, Bogor Institute of Agriculture, 2013, pp. 144 - 146.

Remarks :

→ : Influential

Figure 5. The impact of tidal waves and abrasion in the form of damage to road infrastructure and breakwater walls due to tidal waves

Figure 6. Fishermen built stilt structure for docking their boats due to the increase of sea water level

PROJECT/PROGRAMME OBJECTIVE

19. The main objective of this project is to support climate change adaptation action and its implementing stages in Maluku Province as established in Climate Change Mitigation and Adaptation Road Map and Sustainable Development of Maluku Province. In particular, this project aims to improve the level of adaptability and resilience, as well as to eliminate vulnerability in the social, economic and ecological standpoint from the threat of climate change experienced by coastal communities in three Negeri/Villages, utilizing sustainability principles in managing and leveraging coastal ecosystem region, which are:
    1. Increasing the fisherman knowledge and ability to deal with changes in circulation patterns and fish migration patterns
    2. Improving the coastal ecosystems for the resilience of coastal communities and alternative sources of fishing for local fishing groups.

3. Strengthening the economic resilience of the community through the development of alternative economies in coastal areas that are resistant to climate by utilizing the economic potential of the coast.
4. Strengthening community resilience in the face of disasters through the construction of supporting facilities to minimize the impact of tides and waves.

20. The traditional season calendar that has been used by fishermen is no longer relevant to conditions in the middle of the sea. With the use of Satellite Remote Sensing (SRS) to retrieve sea level data the results are processed with a Geographic Information System (GIS) to detect upwelling areas. The technology is used for remote sensing and mapping for the development and management of marine culture. With this technology fishermen can observe fishing locations on an ongoing basis with accurate and real time data. By overlaying (patching) a map of tuna distribution and upwelling locations resulting from remote sensing, a map of potential fishing ground prediction locations will be obtained based on variations in the month and type of climate event period. To improve the efficiency and effectiveness of fishing operations, the manufacture of FADs that function as a decoy and become a shelter, foraging, spawning and gathering of fish in the fishing ground area should be developed.Rehabilitating coral reef to not only recover the ecological function of the reef, but also to reduce undercurrent pressure that will help negate wave energy toward the land/coastal area. Thus, this will help improve the resilience of the community living in the surrounding coastal area. Recovered coral reefs can serve as a habitat for large pelagic fish, of which the fishermen can catch for commercial or consumption purpose.
21. The development of alternative economy by leveraging the potentials of coastal waters as measures of economy adaptation and resilience to be conducted by coastal community who most commonly works as fish catchers. Unpredictable weather and seasons further impact seafaring activities commonly conducted by men. Thus, the role women hold in coastal economy development is indeed crucial in order to eliminate dependency on the result of fishing yield or to introduce alternative source of economy/income.
22. Extreme tide and abrasion are two threats that can potentially lead to disaster. Abrasion commonly occur bit by bit. The damages caused by abrasion requires time to materialize. As the damages require time to materialize, the threat of abrasion usually goes on unchecked until the impact is directly visible, such as in the form of damages on infrastructure, like roads. The impact of climate change intensifies on coastal area and islands, such as Central Maluku. Rising sea surface and weather anomaly will aggravate the condition, causing abrasion triggers, such as strong waves/tidal energy. Repairing several breakwater points along the ± 500 M breakwater/wave-breaking structure in 3 Negeri is expected to help reduce the risk of disastrous high tides in 3 Negeri, which will help protect ± 800 inhabitants of 3 Negeri who are vulnerable to the threat of high tide. Additionally, this helps protect ± 1.6 KM village road along the coast.

PROJECT/PROGRAMME COMPONENTS AND FINANCING

23. Project implementation will be carried out within three years by implementing the four integrated project components as outlined in **Table 3**.

Tabel 3. Project/Programme Components

PROJECT/ PROGRAMME COMPONENTS	EXPECTED OUTCOME	EXPECTED CONCRETE OUTPUT	AMOUNT

1. Strengthening the adaptation of traditional fishermen in facing changes fish migration and circulation patterns due to climate change	A. Increasing the yield and quality of fish catches of fishermen as well as helping improving the traditional fish catching rules (Sasi Laut)	1.1. There is a map for the new *fishing ground* distribution points based on the circulation pattern and fish migration pattern, as well as updated fishing season calendar 1.2. Rumpon Procurement[9] / Fish Aggregating Device (FAD) 1.3. The provision of Cold Storage in each village	
	B. Enhancement of the capacity and knowledge of fishermen' groups by adopting the climate change adaptation strategies.	1.4. Approximately 150 fishermen (50 fishermen in each village) have new knowledge which is more relevant to the climate change 1.5. The establishment of fishermen' groups which are able to cooperate with government offices, private parties, and non-governmental organizations in order to be able to access technology, group guidance and capitalization	
Sub-total Component 1 :			**231,544.78**
2. Coastal ecosystems repair for the resilience of communities and alternate location for source fishing	A. Restoration of the function of coral reef ecosystems and expanding fishing ground zones for fishermen in nearshore waters	2.1. Rehabilitation of ± 12 hectares of coral reefs in Asilulu and Lima villages in order to expand new fishing grounds near the beach	

[9] Rumpon is a fish aggregator tool utilizing solid-based attractors of various forms and types, whereby functioning to attract fish to gather. This tool will be leveraged to improve the efficiency and effectiveness of fish catching operation.

	B. Increased awareness and active role of coastal communities to rehabilitate, maintain and protect coral reefs	2.2. Approximately 90 people (30 people in each village) have the knowledge on how to do rhabilitation, transplantation, maintenance, care, dan monitoring on coral reefs	
Sub-total Component 2:			**134,123.13**
3. Alternative economic development in coastal areas that are climate-resilient by utilizing technology in fisheries and Marine areas	A. Reducing dependence on livelihoods as catch fishermen	3.1. Aquaculture farming by constructing 9 floating fish ponds for shallow water fish cultivation (3 ponds for each village) each of which is to be managed by the groups (1 group = 20 people's)	
	B. Increasing the role of women in the family economy	3.2. Nine floating fish net ponds for the cultivation of sea weed (3 floating fish ponds for each village) each of which will be managed by the groups (1 group = 20 people's) 3.3. 100 women in the 3 villages have the skills for processing the products of the fish and sea weed cultivation	
Sub-total Component 3 :			**296,712.69**
4. Development of supporting facilities to anticipate the impacts of coastal flooding and tidal waves	Disaster risk reduction such as damage to seaside village roads and saving of community houses on the coast, caused by tidal waves	4. Restoring breakwater structure that stretches (*talud*) ± 500 M long across Negeri Asilulu, Negeri Ureng, and Negeri Lima	

Sub-total Component 4:	**141,238.81**
Project/Programme Execution Cost	84,357.84
Total Project/Programme Cost	803,619.40
Project/programme Cycle Management Fee charged by the Implementing Entity	75,478.07

PROJECTED CALENDER

MILESTONES	EXPECTED DATES
Start of Project/Programme Implementation	15 July 2020
Mid-term Review (if planned)	15 Desember 2021
Project/Programme Closing	30 April 2023
Terminal Evaluation	30 Juni 2023

PART II : PROJECT/PROGRAMME JUSTIFICATION

A. *Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.*

Component 1- Strengthening the adaptation of traditional fishermen in facing changes fish migration and circulation patterns due to climate change

23. Tuna is one of the fish commonly caught by the traditional fishermen in the project location. Tuna belongs the group of large pelagic fish, in Thuninni tribe (*Genus : Thunnus*). Tuna price in the project location depends on the freshness of the fish. Fishermen sells tuna to tuna processing company in the form of fish *loin*[10] fish. Tuna fish to be *loin* have to weigh between 10-15 Kg. Price range of loin tuna in the wholesalers/tuna processing company depends on the freshness of the *loin* fish. Meanwhile, caught tuna fish weighing under 10 Kg are sold in the traditional market in Ambon by *palele*[11] with sale price ranging between IDR35,000 to IDR60,000 per fish (depends on the weight and size of the fish).

Table 4. Sale Value of Tuna/Kg According to the Freshness Level in the Project Location

Fish Freshness Level (Fish Classification)	Wholesaler Selling Price/Kg (IDR)

[10] Fish are cleaned by cutting the heads and removing the gills and innards
[11] Local term for female merchants who are trading in the traditional markets or by peddling the goods

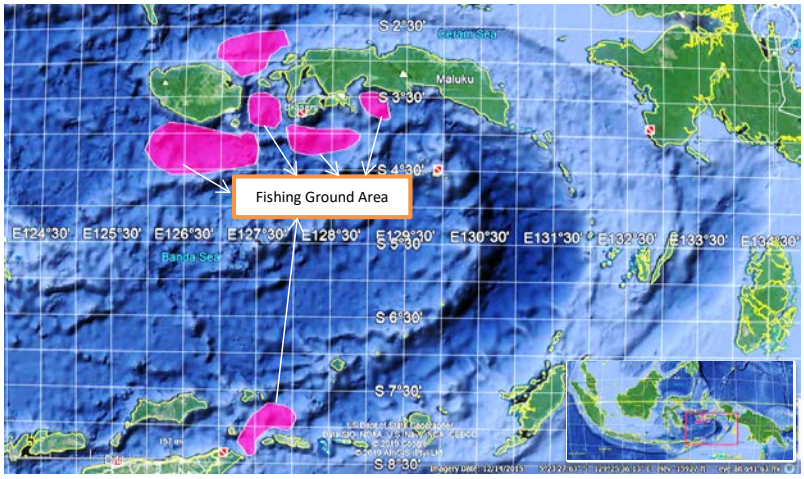
A	**45.000 - 60.000**
B	**30.000 - 40.000**
C	**12.000 - 20.000**

Source: Interview with Fishermen in Negeri Asilulu, Ureng, and Lima (2019)

In one fishing trip, traditional fishermen in the project location usually can catch between 150-200kg of tuna fish loin. This is only achievable during East Wind Season in the East Monsoon Season in Banda Sea and Seram Sea (July-September) and during transition from East Monsoon Season to West Monsoon Season (October-November). Meanwhile, on West Monsoon Season (January-April), fisherman fishing yield will drop drastically due to less frequent sailing as they have to face extreme waves and heavy storm. The impact is skyrocketing production cost for fisherman in order to keep sailing. Also, only highly-skilled fishermen and adequately equipped fleet that can afford to keep sailing and fishing in the sea[12].

24. In extreme weather scenario, such as high intensity of storms, fish migration pattern[13] becomes far more difficult to predict and tends to get much farther from the land. By utilizing *fishing ground* area map that combines both fisherman traditional insight and modern knowledge technology, it is expected that this map can serve as a reference for fishermen in three Negeri to understand the pattern of fish circulation and migration and help update the fish catching season calendar. Rumpon created and placed in the *fishing ground* acquired from the mapping will serve as fish temporary stopover point during migration and the spawning and feeding ground.

Picture 7. Current Fisherman Fishing Ground Area in 3 Negeri



Outcome A: Increasing the yield and quality of fish catches of fishermen as well as helping improving the traditional fish catching rules (*Sasi Laut*). The proposed activities include:

[12] The majority of fish catching vessels owned by fishermen in 3 Negeri is viber type fish catching vessels with the capacity of < 5 – 7 *Gross Ton*nage (GT), which have limited exploring ability in deep ocean waters

[13] Migration is a part of fish life cycle during which they find the habitat with suitable conditions for their survival.

1.1. There is a map for the new *fishing ground* distribution points based on the circulation pattern and fish migration pattern, as well as updated fishing season calendar

The changing season patterns make it difficult for fishermen to determine the right fishing season. During this time to determine the time to go to sea and the location of fishing ground, fishermen are guided by the "calendar of seasons" made by "the elders", namely old fishermen who are considered very experienced and have extensive knowledge of the sea. There is a belief that is believed for generations by fishermen is that fishing in the sea is very dependent on the right time or called *tanoar*. *Tanoar* is the local language which means to do everything based on the calculation of the celestial moon. however, the season calendar is no longer relevant to curent condiition. Although some fishermen have begun to no longer depend or trust for *tanoar*, some people are still consistent and apply *tanoar*.

Table 5. Traditional calendar of the season

No	Fishing Ground Area	Season/Month											
		West Season		Transition Time East			East Season			Transition Time West			West Season
		1	2	3	4	5	6	7	8	9	10	11	12
1	Asilulu Waters			•	•	•				•	•	•	
2	Seram Waters			•	•	•				•	•	•	
3	Buru Waters									•	•	•	
4	Banda Waters												
5	Nusaniwe Waters	•	•										
6	Salahutu Waters	•	•										
7	Nusalaut Waters	•	•										
8	Obi Waters	•	•										
9	Kelang Waters	•	•										

Through a technology and modern knowledge approach on migration patterns and fish seasons integrated with traditional knowledge, this output will result in a map of *fishing ground* distribution points and an updated fish season calendar that will greatly help fishermen. Technology used in this output is Satellite Remote Sensing *(SRS*) to obtain data on sea surface of which result will `be processed using *Geographic Information System* (GIS) to detect *upwelling* areas. The technology is used to enable remote sensing and mapping in attempt to develop and manage marine aquaculture. With this technology, fishers can continuously observe fishing grounds using accurate and *real time* data. With overlaying tuna fish distribution map and the *upwelling* location generated from the remote sensing, a location map of predicted potential tuna *fishing ground* can be obtained based on the variation of the moon and the types of climate event period. In addition to this technology, in its implementation it requires direct field observation to confirm the SRS data with fishing seasons pattern analysis using the *Average Percentage Methods* based on *Times Series Analysis*[14]. The result of the analysis is then being integrated with the knowledge and experience of

[14] Spiegel, MR 1961.*Theory and Problems of Statistics*.Schaum Publ.Co., New York.Page359

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fishers in 3 Nagari to draw data conclusion which shows fishing season and non-fishing season, fishing ground and no-fishing ground.

In technological aspect, the fishing ground mapping carried out in this project has taken into account practices developed in Indonesia and international. *Such as the use of SRS technology which was popularized by Professor Sei-Ichi Saitoh*[15] *which reveals that the utilization of Satellite Remote Sensing* (SRS) may help maintain the sustainability of fishery and aquaculture. The integration of such modern technology, together with the integration of field research with traditional knowledge will render the produced output capable of responding to the fisher community's problems in 3 Negeri. The traditional Calender of the season (Table 5), will be the method used to the beginning study when formulating a new fishing ground areas and season calender.

The most important results of the analysis of the two methods above are how to integrate them with the knowledge and experience of the fishermen in 3 Negari including the habits of the fishermen groups and the tuna fishing company that had taken place before the project started. So this project will invite all stakeholders to sit together in the FGD to collaborate all research results and practices in the field to be made into a joint agreement that will be determined to be an inter-country regulation (*Sasi Laut*) related to the use of FADs in the new capture zone, including regulations related to fishing cacth, zoning, and schedule of each group.

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Sasi Laut is a very effective method to socialize regulations and provisions regarding calendars and capture zones, because basically the 3 Negeri community already has a variety of local wisdom in the form of customary laws which they highly value as norms governing the preservation of natural resources. So the components of this project will strengthen local wisdom.

The project implementation is broken down in the following phases:

1.1.1. *Study on the circulation pattern and fish migration and fish season calendar in the project site*

The implementation of this activity will start with a *Focus Group Discussion* (FGD). with a number of *stakeholders* (Academic experts, Marine and Fisheries Ministry , Marine and Fisheries agency , Central Maluku Regency and Maluku Province, local NGOs) and community components (Fisherman, Negeri Government, Customary Eldes/The head of Customary, Youth Groups and Women Groups) to obtain preliminary data concerning the initial constraints and potentials related to changes in circulation patterns and fish migration on the seasonal calendar which has been used by fishing communities as a reference, information on possible changes in circulation patterns and migration of tuna in the sea, and information on locations of existing *fishing grounds*. The activity involved community figures who take hold of *Tanoar* (the guideline for determining the season and location of fish by month~~), involving academic experts, the government (Ministry of Maritime Affairs and Fisheries), local NGOs, and at least 10 representative fishermen from all villages.~~ The implementation of this activity will involve marine mapping expert who will map with the SRS methode, field researchers who will conduct

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[15] A researcher and professor from Hokkaido University, Japan. Prof. Saitoh is one of the experts in determining the position of fishing grounds using SRS technology. Prof. Saitoh has already published many international publications, and frequently collaborated with numerous institutions in a number of countries, including America and Europe.

direct field observations to confirm SRS data, fisheris expert and oceanographer from the Pattimura University (Maritime Study Center) will provide input on project effectiveness.

fishery and marine experts.

1.1.2. *Reviewing the location and mapping the fishing ground*

Reviewing the currently effective *fishing ground* locations is carried out by experts along with fishermen and fishermen figures, and analyzing the existing potentials. At least 6 locations are sampled, and the relationship between upwelling location and potential fishing ground for tuna is then investigated. This study employs descriptive analysis method by comparing characteristics of upwelling location, bioecology and tuna fisheries. To review fish season, the percentage of captures is calculated using *The Average Percentage Methods* which is based on *Times Series Analysis* and the result will be the basis of the new fish season calendar.

With this method at least 6 sample locations were taken and continued to study the relationship between the *upwelling* location and potential tuna *fishing ground*. This research method uses descriptive analysis by comparing data on the characteristics of *upwelling*, bioecological and tuna fisheries, the results of which will be the basis of a new fish season calendar.

1.1.3. *Workshop for establishing the season calendar and map of the new fishing ground area*

The data resulted from the study are clarified with the *stakeholders* which include fishermen, fishermen groups, community figures from each Negeri, academics, and regional governments. The workshop will produce a new fishing season calendar and a map of the *fishing ground* area.

The results of the finalization of the mapping will be pushed to improve *sasi* (sea customary regulations) that will be applied in the future, and will also be consulted for approval in regional regulations or regulations at the country level. The workshop will also agree on and arrange a fishing season calendar and fishing catchment areas / areas in each country. Workshop will also be agreed on and establish fishing season calendar as well as region/area for fishermen to fish in each Negeri.

1.2. Rumpon Procurement[16] / Fish Aggregating Device (FAD)

Once *fishing ground* area is mapped, in order to improve the efficiency and effectiveness of fish catching operation, rumpon will be created that will serve as an attractor and aggregating spot, where fish can protect themselves, feed, breed, and gather in the *fishing ground area.* Tuna and other large pelagic fish prefer shaded spot with abundance of foods. Under rumpon, there can be found many planktons and various smaller pelagic fish, such as mackerels, cobs, skipjacks, and sardines that gather and serve as food source for larger pelagic fish. Rumpon procurement shall be an alternative for generating productive artificial fishing ground and offer peace of minds for fishermen in dire times. From the interview with fishermen in the project location, manufacturing cost to spend for a single fishing trip is IDR800,000 and the

[16] Rumpon is a fish aggregator tool utilizing solid-based attractors of various forms and types, whereby functioning to attract fish to gather. This tool will be leveraged to improve the efficiency and effectiveness of fish catching operation.

ideal result is 150-250 kg tuna fish. By utilizing rumpon in the *fishing ground* area, fisherman's operational cost will reduce by 40-60% compared to when rumpon is not utilized as they have to search for and catch school of fish in the broader, deeper area of the ocean.

Rumpon will be installed in certain points according to consultation with the Provincial Office of Marinetime Affairs and Fisheries agency pursuant to the Regulation of the Ministry of Maritime Affairs and Fisheries No. 26/PERMEN-KP/2014 on Rumpon. Installed Rumpon shall meet the mechanism for fishing permit, SIPI (Fishing Permit), SIUP (Fishing Business Permit), and SIPR (Rumpon Installation Permit). The installation process will receive training and be supervised directly by the Marine and Fisiheries Ministry or Marine and Fisheries agency Maluku Province. Licensing will regulate the type of FADs, placement provisions, installation techniques, fishing gear, operating permits, boat permits, restrictions on the number and types of catches so that it can guarantee that it will not endanger other marine animal populations such as sea turtles and others. Marine biota. The fishermen group will also make operational reports every 6 months to the KKP director general including the installation and utilization report.

Rumpon to be utilized is anchored rumpon (*anchored FAD*). This tool consists of floater, attractor (*fish aggregator*) and anchor (ballast). For *attractor*, fishermen will use coconut leaf (or nipah) that will submerged under the ocean at 10-30 of depth. Ballast will utilize a set of 4-6 used oil drums of 200 liters, which will be filled with concrete. Anchored rumpon can be installed in the ocean with depth of 2,000-4,000 meters.

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Picture 8. Illustration of Rumpon Types with fiber floater and raft

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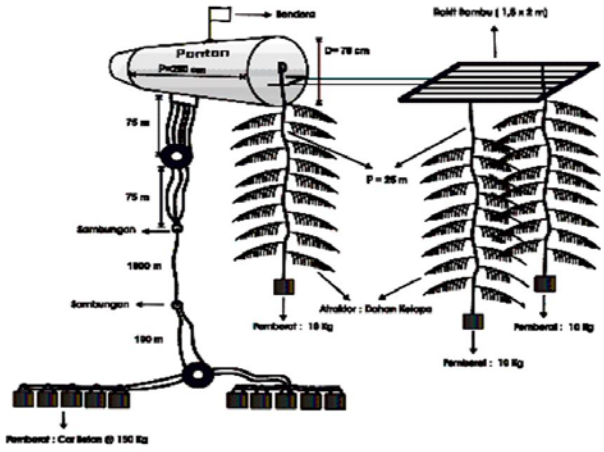

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~~**Picture 7. Illustration of Rumpon Types with fiber floater and raft**~~

The arrangement and scheduling for rumpon utilization and *fishing ground* location selection shall be regulated through Negeri/Village Regulation and/or agreement between Negeri. This will also be socialized to fisherman groups in three Negeri.

1.3. **Provision of Cold Storage in each village**

Referring to the quality standard of fresh fish based on SNI 2729: 2013, the characteristics of good quality fish can be seen from: eyes (convex eyeballs, clear corneas and pupils, specific shiny species of fish), gills (dark red or brown gills) reddish, ripping, with a little transparent mucus), mucus (clear, transparent, shiny, bright mucus layer), meat (very bright flesh incisions, specific types, very strong flesh tissue), odor (very fresh, specific strong type), texture (solid, compact, elastic). The principle used in handling wet fish is to maintain the freshness of fish as long as possible by treating fish carefully, carefully, clean, healthy, hygienic and immediately and quickly reduce the temperature or cool the fish to reach temperatures around 0^0 C – 5^0 C.

The obstacle faced by fishermen due to climate change is the difficulty of determining fishing areas in deep waters, so that it makes fishermen need more time at sea and will increase the risk of fish becoming not fresh. *Cold Storage* or fish refrigeration facilities are needed to maintain the freshness of fish longer to the buyer, so the role of Cold Storage can also keep the selling price of fishermen's catches do not decrease when the catch is declining. So far, fishermen have been forced to sell the catch tuna to the closest collectors, both small-scale collectors and companies, because they cannot keep the catch longer. Because, the longer the fish is stored in the Cold Box will temporarily cause the freshness of the fish to decrease with a sign that the fish's meat is pale and oily / runny. Under these conditions, fishermen are better off lowering the selling price to the nearest collectors who do have Cold Storage facilities rather than having to bear losses. In marketing tuna fish are categorized in several grades to determine the selling price, namely grade A is the best quality of tuna meat that has been loined (cleaned of stomach, head, and bone issues) and meat is still fresh as if it was just caught with watermelon red meat characteristics and chewy texture, collectors appreciate Rp. 45,000 up to Rp. 60,000. As for grade B, the color of the fish meat has been a little pale and a bit slimy, the merchant traders appreciate Rp. 30,000 up to Rp. 40,000. While the lowest grade is grade C with the condition of the meat has turned pale and only valued Rp. 12,000 up to Rp. 20,000, - even under certain conditions traders do not buy tuna with grade C. From this condition, why the role of adequate Cold Storage for fishing groups is very important, namely to maintain the quality of fish, at least until fishermen get the best prices on the market.

The challenge is not market access because tuna is the major commodity in Maluku Province. The main problem is to maintain the freshness of fish in order to continue to have high economic value, however to further strengthen the potential of a profitable market for local fishing groups, this project will ensure that each fishing group can find a market that provides high profits. This effort can be achieved by building commitment between fishing groups and local companies such as PT Ureng Nusa Telu in the Ureng Negeri and several home-based businesses

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With the *Cold Storage*, fishermen are increasingly free to determine the market and can increase the difference in selling value of approximately up to Rp. 12,000 / kg. To achieve this target the project will provide 3 Cold Storage (one Cold Storage for each Negeri) with Cold Storage building specifications required by fishermen groups in the form of a 5x6 square meter semi-permanent building with cement floor and board walls, equipped with several Cold Boxes from a styrofoam material that can accommodate 1 Ton of tuna per day. The Cold Storage building specifications will refer to the provisions of Law Number 28 of 2002 regarding the Buildings to meet the Construction Standards and Administrative Requirements consisting of Land Rights Certificates, Documents showing ownership of buildings and Building Construction Permits. The use and utilization of Cold Storage will be managed and regulated in groups.

To ensure the continued use of cold storage, fishermen groups will form a cold storage management unit that will regulate the mechanism for storing fish caught by fishermen stored in cold storage (amount and time of storage). Each member of a fishing group that stores fish in cold storage will be charged a storage fee (the amount of the storage fee will be agreed upon). The storage costs paid by the fishermen will be used for cold storage maintenance costs and additional cold storage in the future.

Outcome B: Enhancement of the capacity and knowledge of fishermen' groups by adopting the climate change adaptation strategies.

1.4. About 150 fishermen (50 fishermen in each village) have new knowledge which is more relevant to the climate change

The mapped circulation pattern and fish migration in the *fishing ground* zone and the updated the fishing season calendar raise the need to update the rules for traditional fishing (Sasi Laut) which the fishing community at the project site has used as a guideline. In addition, there is a potential for adjustment of fishing gear and fishing time in the new *fishing ground* area. Therefore, it is necessary that the fishermen in the project site have the capability to adapt in order to answer these challenges through the following activities:

1.4.1. Strengthening institutional groups of fishermen in three Negeri

It can be done by either strengthening the existing institutions in these three Negeri or by establishing new institutions. Strengthening institutions begins with a meeting to establish a mutual understanding regarding the updates made on the traditional fishing rules (sasi laut), and arranging the adaptation strategies to address potential emergence of challenges and obstacles in the application of fishing rules to be carried out in the new *fishing ground* area, formulating DAD allocations to support fisherman adaptation activities, as well as mapping stakeholders who can support the activities of fishermen groups in the project site. This activity will involve 150

people from the traditional fishing groups (50 fishermen from each Negeri) and the government of the Negeri.

1.4.2. Mentoring fishermen groups in the three Negeri

Mentoring aims to help fishermen groups improve their capacity and solidity in understanding and implementing climate change adaptation strategies, help to access fisheries technology, group consultation, access to capital, and to build a network with *stakeholders* - including government - for the institution sustainability post-project.

1.5. The establishment of fishermen' groups which are able to cooperate with government offices, private parties, and non-governmental organizations in order to be able to access technology, group guidance and capitalization

To ensure the establishment of fishermen groups, some of the strategies that will be carried out are:

a. The fishermen group will be officially registered with the Central Maluku Regency's maritime and Fisheries Agency, because to be able to access the empowerment / guidance program, access to technology and capital, the fishermen group must be registered with the Marine and Fisheries Agency
b. Participate in various meetings and trainings conducted by the Office of Marine and Fisheries Agency at Central Maluku Regency or relevant institutions (including NGOs, universities, and companies) with the need to increase the capacity of fishermen groups.
c. Promoting activities and best practices carried out by fishermen groups (Video Project, Stories Project, etc)
d. Establish cooperation (MoU With a fish storage company) as a supplier of fish with agreed fish quality standards and selling prices

Some institutions that will be targeted for collaboration and or that can support fishermen groups are:

1. Government
   a. Marine and Fisheries Ministry ; 1) Directorate General of Fisheries Catch, 2) Directorate General of Marine Space Management, 3) Marine and Fisheries Research and Human Resources Agency
   b. Environment and Forest ministry : Directorate general of climate change control
   c. Marine and Fisheries Agency of Maluku Province and Central Maluku
   d. Cooperatives and small and medium businesses Agency of Maluku Province and Central Maluku
   e. Regional Development Planning Board Maluku Province
   f. Environment and Forest Agency of Maluku Province
2. Pattimura University (Maritime Study Center)
3. NGO (Kiara, WWF, Tifa Damai, USAID)
4. Company
   a. PT Ureng Nusa Telu
   b. PT Bersama Mitra Nusantara
   c. PT Harta Samudera

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d. PT Perikanan Nusantara

5. Bank

Bank BRI through the People's Business Credit program or the Fishermen's Capital Outlet Program (Gemonel).

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Komponen 2- Coastal ecosystems repair for the resilience of communities and alternate location for source fishing

25. This project will focus on restoring a number of *coral reefs* that have already begun to get damaged due to rising sea water temperatures and flash floods caused by the Wai Ela dam break in 2013. Climate conditions cause coral reefs to break down and, as a result, the population of pelagic fish living in the shallow water decline drastically, while at the same time, the increasing risks of fishing due to strong winds and high waves discourage fishermen to go fishing. In some villages, fishermen who have economic alternatives such as trading, farming and gardening can still make a living in these conditions, but the people with no alternative livelihoods face difficult challenges to support their family.

Table 5. Extent and Condition of Coral Reef in Central Maluku Regency

Sub-District	Kondisi Terumbu Karang (Ha)		
	Extent	Good	Damaged
Banda	824,50	775,00	49,50
Tehoru	461,60	421,90	39,80
Teluti	477,60	431,90	45,80
Amahai	839,30	783,10	56,20
Kota Masohi	48,40	30,80	17,60
Teluk Elpaputih	9,60	5,80	3,80
Teon Nila Serua	-	-	-
Saparua	223,40	195,90	27,50
Saparua Timur	-	-	-
Nusalaut	96.,20	91,00	5,20
Pulau Haruku	327,20	295,70	31,50
Salahutu	233,70	224,50	9,20
Leihitu	678,20	621,90	56,30
Leihitu Barat	54,00	37,00	17,00
Seram Utara	1 010,40	887,50	122,90
Seram Utara Barat	450,90	406,80	44,10
Seram Utara Timur Kobi	499,20	440,70	58,50
Seram Utara Timur Seti	511,20	446,70	64,50
Total	**6 754,40**	**6 096,20**	**649,20**

Source: Central Maluku Regency Maritime Affairs and Fisheries Office, 2017

Outcome A: Restoration/Rehabilitation of the function coral reef ecosystems and expanding fishing ground zones for fishermen in nearshore waters

2.1. Rehabilitation of ± 12 hectares of coral reefs in Asilulu and Lima villages in order to expand new fishing grounds near the beach

Coral reefs play a main role as habitat (home), *nursery ground*, *spawning ground*, and also as *feeding ground* for numerous types of marine biota that make coral reefs its habitat. Coral reef restoration is a basic intervention that will restore shallow water conditions in the hope that it will become a home for pelagic fish, so that fishermen can fish them for commercial purpose or consumption. The results generated from the components of this project will lead to improving people's livelihoods and resilience to climate change, economic improvement, food security, and the recovery of coastal ecosystems.

Besides implementing the project to rehabilitate, this project is also interpreted as an effort to conserve, maintain and expand coral reef areas. The implementation of this project will apply the latest technology adaptation, namely the rehabilitation of wave-resistant coral reefs, by increasing the effectiveness of the cultivation system and grafting/transplantation techniques with a success rate of 90-100%. Water territory near project location has unpredicted seawaves which tend to be big and high, in which case it may pose the coral reef seeds to damage risk when there are strong waves and underwater currents. If the target of ± 12 ha in Asilulu and Lima villages is achieved, the use of this grafting technique will at least reduce up to 97% of the wave energy and break the waves up to 86%[17].Therefore, it can solve the problem concerning minimum *fishing ground* location, especially in areas near the coast and it can also reduce waves that hit wave barriers and the impacts of abrasion. Local government authorities with expertise in various fields will be involved in this project as an intervention to lead and contribute and integrate existing innovations into regional government development strategies.

Consultation with the village governments indicates that some programs can be conducted collaboratively, including Village Community empowerment activities that allow them to be aligned with coral reefs cultivation and ecotourism. Village allocation funds can be budgeted for the needs of developing coral reef ecotourism facilities and infrastructure in the form of grants. Revenue derived from the management of ecotourism is expected to contribute to the expansion of coral reef rehabilitation

This activity will involve the active role of youth groups in each Negeri starting from the planning, implementation, maintenance and monitoring of coral reef restoration. To achieve this output, the activities that will be carried out are:

2.1.1. Consultation with Regional Government and the relevant Office of Marine Affairs and Fisheries Regarding Coral Reef Restoration Techniques in 3 Negeri.

To establish the program foundation and to nurture government involvement in determining restoration areas, the Regional Development Planning Board (BAPPEDA) will collaborate with the Office of Marine Affairs and Fisheries in Province and Municipality level, Government of 3 Negeri, as well as the communities. Consultation with Regional Development Planning Board (BAPPEDA) will involve brainstorming on the Regional Spatial Planning (RTRW) in the project location. On a side note, the consultation with the Office of Marine Affairs and Fisheries will aim to obtain direction regarding the ministerial decree no. KEP.38/MEN/2004 on General Guidelines on the Management of Coral Reef and regarding the Guidelines for Coral Reef Rehabilitation issued by the Directorate of

[17] DANIEL D. PELASULA Pusat Penelitian Laut Dalam – LIPI , *REHABILITASI TERUMBU KARANG TELUK AMBON SEBAGAI UPAYA UNTUK MEREDUKSI EMISI CARBON CO2,* http://ditjenppi.menlhk.go.id/reddplus/images/resources/workshop_kapasitas/paparan_Daniel_D_Pelasula

Maritime Conservation and Biodiversity and the Directorate General for Marine Space Management. There is also Village Allocated Fund (Dana Alokasi Desa or DAD) to be utilized by the village government in supporting the expansion of restoration areas, as well as its preservation measures. In this case, the program will also involve Customs Council in planning the marine rules (marine customary law), which will be developed into regional regulations, in the hope that the restored coral reef will be preserved and protected, as well as to impose risks and penalties on those who violate the regulations. There will also be consultations with various communities and groups in the communities, among which, fisherman groups, customs practitioners, youth groups, as well as woman groups, especially those who are involved in the restoration of coral reef.

2.1.2 *Survey and selection of locations for ~~coral transplantation~~artificial reef*

The selection of locations is determined by the results of field surveys in shallow sea waters with a large amount of damage. The survey will monitor the extent of damage and also control the recruitment of coral reefs in the area. And then, determine the optimal location of reef rehabilitation as well as its environmental impact . The determination and review of locations will take into account physical, chemical and biological factors. Algae and coral diseases are factors that will be considered. Locations that contain at least macro algae will be prioritized for restoration/rehabilitation. Aside from the rehabilitation, locations selected for coral reef seedbed will also consider the embankment positions, which is prone to damages due to the high tide and abrasion, as the coral reef will effectively help alleviate the impact from wave's kinetic energy toward the land[18].

Artificial reefs are placed in habitats that have decreased and areas that have low productivity (Yahmantoro and Budiyanto 1991). Some criteria for laying artificial reefs:

1. The location is close to the fishing settlement.
2. Separate from natural reefs.
3. The waters are quite clear.
4. Depth based on distance from coastal waters and the ability of divers make observations into concerned.
5. The condition of the waters meets the living requirements of coral reefs (Circulation, saliity, brightness, sedimentation and depth).
6. The state of the substrate is quite hard and flat(even) to prevent artificial reefs embedded into the base.
7. Orientation (location) in relation to fish migration patterns and
8. Does not harm navigation.

The type of data collected in this plan are primary data and secondary data. Primary data obtained from the results of field measurements, consisting of : Bathymetry topographic survey(elevation and distance), Sea water quality data (salinity, sea current speed, pH, temperature, turbidity). Secondary data namely hydrological data, climatology data(data on wind direction, tides at Pemangkat station, and current direction), bathymetry maps, maps administration of current and wind direction maps. Analyzing the form of construction or dimensions of

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[18]This is explained in various literatures, among which, https://ilmugeografi.com/ilmu-bumi/laut/manfaat-terumbu-karang, accessed 31 December 2019.

artificial reefs, materials and methods that are appropriate to the location the planning. Plan and determine the size of artificial coral reefs and detailed design drawings. Detailed design drawings will be used as technical guidelines in the making artificial reef.

This activity will be carried out in a participatory manner with local residents, volunteers, local NGOs, and experts in the field of coral reef restoration and rehabilitation. The activities include mapping the potentials, capture points, and weather with a target area of ± 12 ha mapped in the area of Negeri Lima and Negeri Asilulu.

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Picture 8. The planned location of coral reef rehabilitation on Hatala Island and Lain islands in Asilulu

Picture 9. Planned location for rehabilitation of coral reefs in Negeri Lima

The planned location for coral reef rehabilitation / rehabilitation as shown in Figure 8 and Figure 9 will be examined and confirmed further after the survey will be conducted with oceanographers and coral reef experts.

2.1.3. *Making Artificial Reef Concrete and Transplant Seeds*

Making concrete seeds is done by youth groups and women's groups that have been given training. Rehabilitation of coral reefs will be carried out by combining methods between artificial reef and transplantation. Seedlings will be obtained from locations that are in accordance with the KKP Office's permit to be transplanted, transplants that have been cut into small pieces of 7 cm / seedlings as coral saplings that will trigger the acceleration of artificial coral growth. Construction of artificial reefs Artificial reefs will be made of concrete using Portland cement Type V, this type of cement is suitable for the manufacture of concrete in areas where soil and water have high sulfate salts such as sea water. The design and form of the artificial reef that will be used refers to the results of the initial study that has been carried out at the previous activity stage. Several forms or models of artificial reefs are known. From the shape of the ball (Reef Ball), cube, or pyramid shape (pyramid). This model is usually composed of various basic shapes, such as concrete blocks (cement) to form a cube or pyramid. The minimum target for laying is 300 units of artificial reef with details of size 1x1 M3 covering ± 12 ha in the territory of Negeri Asiliulu and Negeri Lima.

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2.1.4. *Monitoring, Maintenance and preservation of coral reefs*

These activities aim to ensure that the transplanted coral reefs grow well and none of them are carried away. To ensure that coral reefs are growing well, monitoring and intensive care through cleaning up diseases and algae attached to coral reefs will be carried out periodically. This activity will fully involve the formed youth coral reef groups.

Outcome B: Increased awareness and active role of coastal communities to rehabilitate, maintain and maintain coral reefs

The success of the activities to restore shallow marine ecosystems will be largely determined by the active role of the local people in the project site. An enabling condition that must be created is to understand the impacts of coral reef damage and the benefits that can be obtained if the restoration/rehabilitation of coral reefs is successful. In addition, it requires knowledge and capacity to perform coral reef transplantation techniques, coral reef maintenance and preservation, and regular monitoring. To create the enabling conditions, following are the stages of activities to be carried out:

2.2. About 90 young people (30 people from each Negeri) knows how to do transplantation, maintenance, care and monitoring of coral reefs

In addition to fishermen groups, the existence of young age groups (men and women) found in three Negeri is a social capital that can be utilized as the main actor in efforts to rehabilitate coral reef ecosystems in the project site. The involvement of all parties, both

men and women is needed to ensure that all modalities can be utilized to achieve project objectives.

2.2.1. *Training for youth groups on making articial reefs and cultivation/transplantation, maintenance and preservation of coral reefs*

This activity will target youth groups in Negeri Lima, Negeri Asilulu, and Ureng, targeting 30 young people from each Negeri. This activity does not only puts emphasis on improving the knowledge and technical capacity regarding coral transplantation methods, but also raising the awareness of youth groups about the benefits of coral reefs in terms of social, economic and ecological aspects. Therefore, this activity will also be a momentum to establish youth groups to save coral reefs in each Negeri. At least, there should be one group in each Negeri that will be actively involved in coral reef restoration from transplantation to monitoring.

2.2.2. *Training on sustainable coral reef monitoring and organizational strengthening of the three youth groups to save coral reefs in the three Negeri*

The training aims to prepare a community that will sustainably maintain the cultivated coral reefs with a target of at least 90% of coral reefs growing well. Mentoring aims to ensure the proper monitoring of transplanted coral reefs, as well as to improve the ability of youth groups to synergize with the government and build networks with related *stakeholders* to map other improvable potentials such as coral reef ecotourism concept and so on.

These groups are expected to synergize with fishermen groups within the project site to be able to enforce DAD to support the maintenance and development of coral reefs which are potential source of income for the people as well as the development of coral reef nursery points and areas in other post-project sites. Proposing mechanism for DAD allocation for this tourism development is started with program proposal of developing tourism and coral reefs restoration by the youth and fisher communities to get the proposal listed in the Negeri's Government Working Plan (RKP) which is drafted annually through the Village/Negeri Development Planning Forum. Once the program proposal is approved and listed in the Negeri's government working plan, the next step is for Negeri government to draft Negeri's Local Budget and to propose them to Regency Government for evaluation. The budget will be approved then by Negeri Government once the Regency Government accepts the proposal. DAD of Negeri Government will be then used to finance the development of submarine tourism, such as the development of its supporting means and facilities. In the future, income generated as the result of developing this submarine tourism can be jointly managed by the groups and Negeri Government by establishing Negeri Government Owned Enterprise to handle the tourism management.

The mobilization strategy will be carried out with engagement with each target stakeholder, especially the main and secondary stakeholders by introducing the project's vision and mission and synchronizing project achievements in line with their interests and objectives. Communication, the project will establish communication and exchange of information related to project developments in the form of letters or reports, campaigns, project video, and promotions to increase trust and garner stakeholder support for the achievement of the project. Involving an active role, in this project, stake holders will open space for participation ranging from planning, implementation, evaluation, and monitoring or maintenance.

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Some indicators that determine the success of this program, such as:

1. The formation of youth groups concerned with coral reefs in each country, which worked together to participate in maintaining and monitoring the development of coral reefs that have been planted
2. Groups that have formed try to expand the planting area of coral reefs in new locations, which require rehabilitation or new ecotourism locations.
3. No more bombing activities to find fish carried out by fishermen, which can damage coral reef habitats.
4. The creation of reef fish habitat, which can be used as an alternative fishing ground.
5. Created community awareness to maintain coral reefs properly and can function to restore the coastal ecosystem.
6. The recovery of + 12 Ha of coral reef ecosystems along the coast 3 Negeri.
7. The existence of potential new and alternative livelihoods with the development of ecotourism programs.

Coral reef care groups will integrate all work programs related to the development of coral reef locations with ecotourism managers who have become BUMNEG and will set aside a portion of the revenue for expanding the potential of coral reefs in other locations. The establishment of BUMNEG will be established with deliberative steps involving all elements in the village, such as the village head, community leaders, NGOs, and so on. In this deliberation, the establishment of BUMNEG will be agreed upon, followed by a discussion on business units, management, sources of capital, and other matters to support the program to be run. Organizational Arrangements, these activities include the duties and functions of each BUMNEG leader. In addition, at this stage, a business plan that will be developed complete with steps that must be immediately discussed. Development, At this stage, the organizational structure has been created and each division understands their respective duties. So, at this stage, the implementation of activities has been carried out. More discussion on technical matters such as determining the third party to be invited to cooperation, the business unit development program that has been agreed upon, as well as formulating the remuneration for BUMNEG members. More details about the establishment of BUMDes or BUMNEG are regulated in the Regulation of the Minister of Villages, Development of Disadvantaged Areas, and Transmigration of the Republic of Indonesia Number 4 of 2015 concerning the Establishment, Management and Management, and Dissolution of Village-Owned Enterprises.

Komponen 3- Alternative economic development in coastal areas that are climate-resilient by utilizing technology in fisheries and Marine areas

26. The majority of the people in the project site has been living in coastal areas for generations and around 80% of their communities work as fishermen and depends on the fisheries and marine sectors especially capture fisheries. Meanwhile, the potential of other coastal resources has not been widely explored. Some of the contributing factors are the lack of knowledge regarding the potential for coastal resource development, the lack of technology and capital to support these activities. As a result, there is not much that the community can do against changes in seasonal and wind patterns that cause a shift in the fish season and *fishing ground* due to changes in circulation patterns and animal migration patterns in the sea as a result of climate change. Meanwhile, the potential for fish availability in shallow water area is not maximized because of damage to coral reef ecosystems. Community direct dependence on marine ecosystems affects their social resilience and ability to deal with shocks, especially in terms of food security and economic vulnerability.

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27. The components of this project will address the economic vulnerability issues of the three Negeri against climate change. Alternative livelihood models that will be developed are based on fisheries and non-fisheries. The success of this project is expected to encourage the government of the Negeri and local governments to adopt and develop alternative livelihood models that will be developed in this project. Alternative economic development will target groups of women in the project site who are not employed and economically dependent on the fish captures obtained by their husbands as household heads.

Outcome A: Reducing dependence on livelihoods as catch fishermen.

3.1. Aquaculture farming with the installation of 9 floating net cages for Cultivating Shallow Water Fish (3 cages for each never) which for every floating net cage, it is managed by a group (1 group = 20 households)

Aquaculture farming or what is commonly known as Water Culture is a form of raising and breeding water animals or plants that uses water as its primary component. There are some types of water cultivation; one of them is fish culture. This project will develop shallow water fish culture using floating net cages in the attempts of developing an alternative economy for 3 negeri community. Every Negeri will install 3 floating net cages, so there will be 9 floating net cages in 3 Negeri~~never~~. This project is designed to be implemented in Negeri Asilulu, Negeri Ureng, Negeri Lima. Every Negeri ~~never~~ has a minimum of 3 floating net cages which will directly managed by the community group. This group will have an active role in developing the fish culture in each of these Negeri.~~never~~.

The feasibility study will be carried out at the beginning of the project with oceanographers and consultants to analyze the location for cultivation. In general, observations of water quality parameters refer to Minister of Environment Decree No. 51 of 2004 concerning Water Quality Standards, seven key parameters have been determined which are considered to be the main parameters that have a significant role in the success of the FNC aquaculture development effort. In addition to referring to these 7 aspects, the project will also analyze the state of the season (west wind and east wind season). The feasibility study will also involve an AMDAL that is part of the licensing requirements.

To achieve these outputs, activities planned to be carried out are:

3.1.1. *Conducting fish culture training for groups in ~~3 every~~ Negeri*

This activity aims to prepare the groups that have been formed in each never for handling a fish culture. Every group consists of 20 households; hence one never will have a minimum 60 households ready to manage the floating net cages. The objective of this training is for every group to have proper knowledge on how to cultivate fish in floating net cages, such as selecting and designating locations for this cages, making the floating net cages design and construction, deciding the layout, knowing what facilities are required for fish culturing, selecting types of fish to culture, and managing as well as marketing them.

3.1.2. *Surveying location for floating net cage*

The groups for this fish culture which have received trainings will conduct a survey to select and designate the locations for the floating net cages together with experts. In this activity, factors to take into account are natural disturbances (storms and water surges), whether predators inhabit the area, contamination, convenience, hydrographical conditions, the potencies of fish that will be culture,

and potential conflicts among users. The survey result can help with the development of the area into floating net cages location for the groups to help improve the economy of people in 3 negeri.

3.1.3. *Design making of floating net cages construction and facilities provision for the fish culture*

This activity may serve as a follow-up activity of the survey conducted together. The groups will decide the design of the floating net cage they will be using for the fish culturing as required and based on the survey result. It is possible that every group may choose different design depending on the location of the survey and types of the fish they wish to culture. However, facilities that they are required to have are basically the same, such as the nets, they are going to need the smallest net size of 2 x 2 x 2 m to 9 x 9 x 9 m which are easily available in the market. Most important also is raft culture that is used to hook the nets, these rafts are commonly made from bamboo, timber, iron, and fiber which have been growingly made and used these days in modern fish culture. The next step is the fish seeds used that are going to be cultivated, usually the seeds can be acquired by purchasing ones or developing their own seeds which is possible with enough knowledge. The types of fish purposedly for this cultivation shall have enough economic value to culture. The supply of fish feeds will accommodate as well the types of fish being cultivated. Supporting facilities that need to be prepared are a guard-house and other assistive equipments.

3.1.4. *Managing the floating net cages*

Every group is required to divide job to each of their members to collectively manage these floating cages. And it is very likely that every group will have their own unique job division following the needs arise within the group. The purpose of this job division is to give members of the group some responsibility to help improve the economy of the people in 3 Negeri. Maintaining floating net cages involves activities from cultivating the fish, harvesting, to marketing the results of these floating net cages.

Wastes in waters can be in the form of deposited, colloidal, suspended and dissolved solids. Sedimented solids will directly settle to the seabed. while other forms will remain in the body of water, the organic material from the FNC waste will become a food source for heterotropic microbes and also species of fish or organic eating shells such as koan fish and shellfish for life and breeding. The biggest source of waste from cage farming is from the feed used, so in this project will consult with the Center for Aquaculture Fisheries Research and Development to get input on best practices of environmentally friendly cage fish farming techniques. At least in this project fish farming will use feed with a minimum phosphorus (P) content (0.6% -0.9%), a feed that produces a low Food Convertion Ratio (FCR) value, including will also avoid drugs and chemicals which is forbidden by the government based on the feed standards set out in the regulation of the Minister of Maritime Affairs and Fisheries no. RI PerMen No. 28 of 2017 concerning Fish Farmers. Technically feeding with the calculation of 3% -5% of body weight biomass of fish per day, and also reduces the frequency of feeding when the appetite of fish is reduced. As for waste that must be handled, it is necessary to make a separate reservoir on land and a management system such as a waste disposal will be made.

The requirements for a FNC fish cultivation permit are contained in Chapter IV Procedures and Conditions for Licensing Issuance / Recommendation of the first part Procedures and

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Conditions for Issuance of SIUP Article 14 To obtain a SIUP as referred to in Article 10 letter a, everyone must submit an application to the Director General by attaching:

a. Business plan;
b. Taxpayer identification number (NPWP);
c. Photocopy of certificate of incorporation of a legal entity / cooperative that states the business field in the field of fish cultivation that has been approved by the agency responsible for the legal entity / cooperative;
d. Certificate of domicile of the company / cooperative;
e. Photocopy of ID card of the person in charge of the company / cooperative;
f. 4 (four) pieces (4×6cm size) photo colour of PIC of the company / cooperative;
g. Recommended fish breeding locations from Provincial or Regency / City Regional Governments; and
h. Analysis of environmental impacts (AMDAL), in accordance with the provisions of the legislation that applicable.

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Outcome B : Improvement the Role of Women in the Family Economy

Andriati (2010)sugest that the number and outpourong of time for women of the coastal community in household activities generally higher than that of the males. This is because of social view of women who in charge of domestic work, which taAndriatikes more time. Housework is done by women, which is before and after doing the job of earning a living to help the husband. This indicates dual role of coastal women(as housewive and as breadwinners), thus causing the women labor mobilties limited. Because women are expected to pay attention in domestic duties, even when it comes to helping their husband to earn a living.

At the project location, fishing was routinhe for men, while activity on the mainland inbolved both domestic and family economic support activities. The participation of women to assit the husbands in meeting the family's economic needs places women at the expense of their daily activities and downtime. The role of women in fisherman's household is important to understand as contributing helps to alleviate the demand of daily necessities of the household. Therfore, gender mainstreaming is an important aspect of project implementation. In this case, both men and women are equal partners to receive fair treatment to access resources, organize, participate, and benefit from all activities.

3.2. Nine floating rafts used to cultivate seaweeds (3 rafts for each never) which for every raft, it is managed by a group (1 group = 20 households).

In Indonesia, there are 3 methods used for seaweed cultivation, they are *Bottom Method*, *Off-bottom Method*, and *Floating Method*. To achieve the above output, method selected is the floating method. Floating method is an engineered form of the off-bottom method. The advantage of using this method is its workability to be applied in deeper water condition but still safe from big water surges, and seaweeds will receive better intensity of sunlight with constant water movement that helps the renewal of nutrition contained in sea water, this will ultimately facilitate better nutrition absorption in seaweeds that contribute to faster growth. Floating rafts are made of fibers, while their anchors are of iron, to ensure long term use. Floating raft from fibers is selected since they are of the best quality, compared to bamboo or timber, which usually last only 3 to 5 uses. Since these rafts will be submerged in the seawater during the period of cultivation

Seaweed cultivation will managed in group with 20 members per group. The plan is for every negeri to have 3 floating rafts for seaweed cultivation where every raft is to be

managed by 1 group. With this, every group will be responsible for this floating raft for seaweed cultivation until the time this project completes. Expectation is put that this seaweed could help improve the economy of the people in 3 negeri by actively involving women community. To achieve these outputs, activities planned to be carried out are:

3.2.1. *Seaweed cultivation training*

This activity aims to prepare the groups that have been formed in each never for handling seaweed cultivation. Every group consists of 20 members. This training is to be given to each group, so they will have enough knowledge about cultivating seaweeds. Since there are factors to take into account when cultivating seaweeds, such as accurate location selection, seeds picking or selection, seeds provision, appropriate seedling method, maintaining seaweed cultivation and harvesting method, and also proper post-harvest handling to be able to increase the economic value of the seaweed.

3.2.2. Surveying *location for seaweed cultivation*

Surveying the location is conducted together by the groups and the experts where appropriate location for cultivating the seaweeds is determined. The basis for selecting this location shall be done in regard to water condition, depth of the water, bottom water, natural supply of seaweeds, and water quality.In the initial stage, this process is necessary to ensure that selected location points are indeed suitable for seaweed farming. For prospective seaweed aquaculture and farm locations, the following matters need to be reviewed: seabed texture, water clarity and brightness, salinity (NaC1 salt in water) analyzed through GIS (*Geographical Information System*) tools, undersea current, nutrients, ocean depth and water pH, as well as the threat of pest and disease. Utilizing the method of analysis, it can directly be known the potential locations available for conducting seaweed farming in 3 Negeri.

3.3.3. *Cultivating seaweeds*

Method used for cultivating seaweeds in this activity is the floating raft. This method is divided into *floating-monocline method* and *floating net method*. In principle, these 2 methods use raft that could be made from bamboo, timber, iron, or fiber as a floating device where ropes or nets used can be hooked. The raft is rectangle in sizes that accommodate the condition reflected in the survey result. The ropes used to tie seaweeds to the raft are nylon type.

After floating raft, the next preparation is the seaweed seeds. Selecting seaweed seeds is key because good seaweed seeds will produce good results. The seaweed seeds then is cut up to small pieces, after that they are tied to the floating raft with 14 cm gap from one to another. Afterwards, raft is being pulled to designated location. What needs to pay attention too is the maintaining of the seaweeds by monitoring them once every 2-3 days. Harvesting seaweeds can be done if seaweeds reach certain weight, of which case, it may take around 1.5 - 4 months.

3.3. 100 women in 3 Negeri have the skill required to process the result of fish culture and seaweed cultivation

To increase economic value of the seaweed harvest result, seaweed processing then is necessary to do. The processing of the entire seaweed harvesting will be done by the women group. Every never will have at least one group that does the processing of seaweed result with better sale value. Processed seaweeds could become the new

economic icon for 3 never, in addition to its sea fish. To achieve these outputs, activities planned to be carried out are:

3.3.1. *Initial seaweed processing training*

The women groups that have been formed will receive seaweed processing training, so they will be able to increase the economic value of the seaweed harvest result. It is expected that every women group can produce different processed seaweed products depending on the group's ability, respectively. In this training, access will also be opened that will connect the women groups with their processed seaweed products to the market.

3.3.2. *Purchasing and advance training on supporting tools used in seaweed processing*

To support smooth seaweed processing, these women groups will receive supporting tools they can use in processing the seaweeds. The purpose of these supporting tools is to maintain the quality of the processed seaweed products where from this higher economic value can be obtained. To increase income gain from the seaweed harvest, further processing is required to transform it into ready-to-use raw produce. Raw produce resulted from processed seaweed may take the forms of agar, carrageenan, and alginate. Agar can be processed into food finished product, pharmacy, cosmetics, and tissue paper. Carrageenan is usually used to make sauces, cattle food, and also pharmacy. While alginate may be processed into textiles and cosmetics, in addition to foodstuff and pharmacy. To facilitate streamline process in seaweed processing, it requires a seaweed processing machine that corresponds to the types of the raw produce it tries to make and which the women group seeks to develop in each Negeri. It is to be hoped that, every Negeri will have different seaweed processing machine so that there will be products of processed seaweed in each Negeri that could become their icon product.

According to the consultation results conducted with women group in 3 Negeri, there are several products to be developed from processed seaweed. Aside from dried *raw materials*, other products from processed seaweed include seaweed flours and various derivative products consisting of final products with higher economic value, such as dodol (traditional candy), jelly candy, packaged sweets, and jelly drinks. There are at least two types of machines to be used in processing seaweed and this will be determined by the group based on the production needs, which are chopping machines and milling machines. Chopping Machines is a machine that will further process the dried seaweed by cutting the seaweed into smaller pieces (chips). Milling Machine is a tool that will change dried seaweed into seaweed flour to be used as raw materials for seaweed-based derivative products. Direct machine providers will provide training related with the operation and maintenance for the two tools utilized by the group members.

The following is the specification of the two machines to be allotted to the groups:

Table 6. The Specifications of seaweed processing machine

The Specifications of Stainless Steel FCC 15 Milling Machine:	**The Specification of Seaweed Chopping Machine:**
Capacity : 30 Kg – 50 Kg/Hour.	

Dimension	: 600 mm x 300 mm x 800 mm.	Process Capacity	: 500 Kg / Hour.
Motor	: Fuel / Electricity Motor.	Power	: 8 PK.
Energy Used	: Fuel / Electricity.	Type	: Seaweed Chopping Machine with Rotary Blade.
Power	: 5.5 HP (Fuel-based Motor) / 2 HP (Electricity-based Motor).	Machine Dimension	: 1200 mm x 800 mm x 1000 mm.
Voltage	: 220 V (Electricity-Based Motor).	Material	: Steel.
Electrical Frequency	: 50 Hz / 60 Hz.	Product Contact Materials	: Food Grade Rated Anticorrosion Stainless Steel
Product Contact Materials	: Stainless Steel 304.	Motor	: Diesel.
Filter Size	: 0,8mm,1mm,1,5mm, & 2mm.	Energy Used	: Solar.
Frame Materials	: Angle Bar 40/40.	Function	: To Chop Seaweed into Smaller Pieces (Chips).
Function	: To grind the seaweed into medicine and food ingredients, which will adhere to the Food Grade material standard.		

The women groups will be given training on how to use these supporting tools and their method of maintenance. The machine will be managed by women group and its maintenance will be the responsibility of each group. The deliverables from Project Component 3 will be synchronized with village strategic programs to ensure the post-project sustainability. Business groups will be in contact with the regional government to obtain institutional training and reinforcement and the business unit should work better as a part of BUMDES. Aside from this, the business group can also connect with investors both from banking or private sectors

Komponen 4- The development of supporting facilities to anticipate coastal flooding and tidal wave

28. Extreme waves and abrasion are one of the potential disasters. Abrasion is generally a type of low on site. Damage caused by abrasion through the process of time. Rising sea levels and weather anomalies will increase triggers for abrasion, such as strong wave energy. Repairing several locations of talud (wave walls) which are located along ± 500 M talud / wave walls 3 Countries are expected to reduce the risk of tidal disasters in 3 Negeri, the impact will be ± 800 lives in 3 Negeri that are potentially threatened by tidal waves . Besides protecting ± 1.6 KM of village roads along the sea coast.

Outcome : Disaster risk reduction such as damage to seaside village roads and saving of community houses on the coast, caused by tidal waves.

This project focuses on restoring the function and physical condition of ± 500 M embankment/breakwater structure in 3 Negeri, with targeted outcome of reducing potential

risks from the occurrence of tidal waves in 3 never, and impact of saving ± 800 lives in 3 Negeri who are potentially facing threats from the occurrence of tidal waves. In addition, it helps as well protect the ± 1.6 KM village road that lies along the seafront. Public Works Service will be involved in this project, from the consultation phase, survey implementation, and recommendation in relation to physical specification of the embankment which will be constructed, and the implementing contractor for the project. As for long-term maintenance after the project is completed, it will be the collective task of the community component and the local government component through its Public Works Service that holds the job, function, and responsibility in the construction and maintenance of the public infrastructure.

4.1. Surveying damaged areas around the embankment

Field survey to identify spots where damage in the embankment are located and to measure the total damage will be conducted together with the community involving the Public Works Service. The result of the survey generates the data for the length of embankment to be repaired. It is expected that the Public Works Services will help with the preparation process of the development or at least willing to have a share in the area development. The survey will be conducted in semester 2 of the project cycle. The survey will be carried out together with the implementing Contractor, the Public Works Agency, and the public of the 3 Negeri. MIE and PIE will be responsible for conducting survey activities. Whereas technical implementers are carried out by Contractors. Environmental impact surveys and studies (including consultations) are targeted to be completed by the end of semester 2 of the project cycle.

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4.2. Embankment (Talud) restoration

Restoring of embankment in 3 Negeri involves the community of the never itself in order to improve the wellbeing of its people. If the result of this survey shows a total of more than 500 M embankment area that requires restoration, it is expected that the Public Works Office could help restore the remaining embankment area that could not be covered by this project. Since the total length of the embankment that this project will restore is only around 500 M.

If the survey results show that the damage to the talud that needs to be repaired is more than 500 M, then it is expected that other stakholders can continue the restoration of the talud that has not been repaired. From the results of the identification of the actors, several stakholders who can be involved to continue the restoration of the talud are the Maluku Provincial Public Works Office, and the Maluku River Basin Office (Directorate General of Water Resources, Ministry of Public Works and Public Housing). Talud restoration will take place in semesters 3 and 4 of the project cycle.

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In implementing environmental preservation and management as the prerequisite for obtaining Business and/or Activity permit. will consider the applicable provisions related with the guidelines for constructing coastal protection structures in accordance with the Circular of the Minister of Public Works No. 07/SE/M/2010, in order to ensure that the construction of coastal protection structures adheres the applicable structural requirements and methods.

Every contractor and subcontractor, as well as any suppliers designated to perform the work must obtain any permits related with the work, such as heavy equipment transportation permit and operational permit for heavy equipment with axle load on public roads, according to Regulation No. 14/1992 on Roads and Government Regulation No. 41/1993 on Road Transportation. In project implementation will comply with the regulation about Workplace Safety and Health (Keselamatan dan kesehatan kerja or K3). Application of K3 management

according to the Regulation of Minister of Labor No. 05/Men/1996 on Workplace Safety and Health Management System and Regulation No. 13/2003 on Employment, The Regulation of Minister of Public Works No. 09/PRT/M/2008 on the Guidelines for Construction K3 Management System for Public Works.

Because Talud is a public facility, the steps used to sustain the long-term care of talud are ensuring that the restored talud become part of the Public Works Department program and is included in the Maluku revenue and expenditure budget structure of the Maluku Province and the Maluku River Region Hall (Directorate General of Water Resources, Ministry of Public Works and Public Housing).

B. *Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and groups within communities, including gender considerations.*

29. As outline earlier in paragraph, the Central Maluku district is consists of small islands that are highly sensitive to the slightest ecological changes. As an archipelago, the ocean' s role is crucial; for both livelihoods and interlink. The high functions and roles of coastal and sea put the situations and conditions of the region profoundly affect living system. Weather and seasons are amo g the things that affect the wave height, strong current and wind speed - which eventually will affect the livelihood and the people mobility. Temprature rising of air and sea have caused coral bleaching and diminished growth. This project will contribute to efforts to strengthen the resilince and adaptation of the community in 3 negeri, both economic, social and environment.

Table 7. Number of Beneficiaries (Direct and Indirect)

Output	Direct Beneficiaries	Indirect Beneficaris
COMPONENT 1		
1.1. There is a map for the new *fishing ground* distribution points based on the circulation pattern and fish migration pattern, as well as updated fishing season calendar	150 Fisherman of Three Negeri	1800 Fisherman of Three Negeri
1.2. Rumpon Procurement/ Fish Aggregating Device (FAD)	150 Fisherman of Three Negeri	1800 Fisherman of Three Negeri
1.3. The Provision of Cold Storage in each Village/Negeri	150 Fisherman of Three Negeri	
1.4. Approximately 150 fishermen (50 fishermen in each village) have new knowledge which is more relevant to the climate change	150 Fisherman of Three Negeri	1800 Fisherman of Three Negeri
1.5. The establishment of fishermen' groups which are able to cooperate with government offices, private parties, and non-governmental organizations in order to be able to access	225 Fisherman of Three Negeri (2 Groups of Fisherman in each Negeri)	1800 Fisherman of Three Negeri

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technology, group guidance and capitalization		
COMPONENT 2		
2.1. Rehabilitation of ± 12 hectares of coral reefs in Asilulu and Lima villages in order to expand new fishing grounds near the beach	90 youth people (Man and Women) as project implementing	1800 Fisherman of Three Negeri (Potensial Fishing Ground Area) 3.208 Family of Three Negeri (Potential ecotourism) Government (Noted : The coral reef rehabilitation project will contribute to improving the ecosystem of coral reef in Leihitu district with 10 Ha or + 18% of the damaged areas targeted)
2.2. Approximately 90 people (30 people in each village) have the knowledge on how to do rhabilitation, transplantation, maintenance, care, dan monitoring on coral reefs	90 youth people (Man and Women) as project implementing	
COMPONENT 3		
3.1. Aquaculture farming by constructing 9 floating fish ponds for shallow water fish cultivation (3 ponds for each village) each of which is to be managed by the groups (1 group = 20 people's)	180 aquaculture fishermen of Three Negeri	
3.2. Nine floating fish net ponds for the cultivation of sea weed (3 floating fish ponds for each village) each of which will be managed by the groups (1 group = 20 people's)	180 people (women Groups) of Three Negeri	
3.3 100 women in the 3 villages/Negeri have the skills for processing the products of the fish and sea weed cultivation	100 people (Women Groups) of Three Negeri	
COMPONENT 4		
Restoring breakwater structure that stretches (*talud*) ± 500 M long across Negeri Asilulu, Negeri Ureng, and Negeri Lima	+ 600 families live along the coastline in Three Negeri	Government

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Table 8. Projected income from project components (Family)/Month

Livelihood activities	Project Component	Project Time Frame			
		Baseline (IDR)	2020/2021 (IDR)	2021/2022 (IDR)	2022/2023 (IDR)
New Fishing Ground and Rumpon (FAD)	1 and 2	Rp. 460.000[19]	Rp. 644.000	Rp. 782.000	Rp. 874.000
Floating Net Cage	3	0	Rp. 750.000	Rp. 850.000	Rp. 1.200.000
Seaweed Cultivation	3	0	Rp. 702.000	Rp. 875.000	Rp. 1.300.000
Smoked Fish Production	3	Rp. 550.000	Rp. 735.000	Rp. 831.000	Rp. 940.000
Salted Fish Product	3	Rp. 435.000	Rp. 650.000	Rp. 745.000	Rp. 875.000
Other Sea Product	2&3	0	Rp. 635.000	Rp. 870.000	Rp. 1.150.000

Environmental Benefits

30. Overall, the total area of coral reefs in Central Maluku district was 6.754 Ha with an area of damaged coral reef ls of 649 Ha and around 56,30 Ha those damaged area in Leihitu district which is as the project location. The coral reef rehabilitation project will contribute to improving the ecosystem of coral reef in Leihitu district with 10 Ha or ± 18% of the damaged areas targeted. Recovery of the function of the coral reef ecosystem at the project site will reduce ecological impact that caused by tidal waves, and it restores the living space of the undersea biota which is in shallow waters because of the reforested coral reefs and spawn the marine biota. Talud which functions as a breakwater, will reduce the risk of abrasion, sedimentation and landslides in the coastal area. The rehabilitation talud will reduces the impact intrusion into land, that resulting in street erosion and public facilities.
31. In addition, maps of the distribution of new fishing grounds based on circulation and fish migration and renewable patterns, which utilize and update the fish calendar that facilitate utilization and affordability, will ensure sustainable management of marine resources (especially fishing), and avoid there is over fisihin on the reef areas.

Economic Benefits

32. According to constanza (2014), the value of coral reefs is 352 U.S. dollars per hectare per year. Meanwhile, Indonesia's coral reefs equal to Rp 45 trillion in value. Cesar (1996) estimates that a pristine coral reef with its Marine sanctuary can make $24,000 /km2/ year if sustainable fishing is made. Areas of damaged coral will earn only $6,000 /km/year, and areas with 75% of damaged yield only about $2,000/km2/year. If coral reefs had experienced more overfishing by quite a few fishermen, economic profits would plunge tremendously. With a 10 ha of rehabilitation of coral reefs and sustainable fishing, thus contributing to the economic recovery of coral reefs that in rehabilitated areas would be $3,520 per year. In addition, direct economic benefits in the implementation of this project are in the form of incentives in the form of wages which are calculated based

[19] https://malukutengahkab.bps.go.id/statictable/2017/06/22/154/pendapatan-perkapita-nelayan-menurut-kecamatan-di-kabupaten-maluku-tengah-2014.html

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on the number of transplanted coral seedlings planted and the creation of *artificial reefs* that will be carried out by the community at the project site.

33. The rising sea temperatures will bring much change to the Marine ecosystems and fish populations of the Maluku province. Fishermen who depend on the demersal fish will face difficulties because the coral bleaching. For fishermen who have caught many pelagic fish, a rise in extreme weather frequencies would reduce the number of safe days to sea. Moreover, changing season patterns will cause migration of pelagic fish and rising sea temperature to reduce the size of the pelagic fish. Therefore, this project not only carried out mapping of the new fisihing ground area, but was strengthened by the provision of FADs and rehabilitation of coral reefs as a food source for small pelagic fish. The location of small pelagic fish that gather in the fishing ground area will be a food source for large fish such as tuna and skipjack. The project component will make it easier for fishermen to fish at sea and cut operational costs when fishing.
34. In addition to the potential of capture fisheries, the diversity of potential and production of fish resources through aquaculture activities shows that in 2014, cultivated land was 118.4 ha or only about 1.01% of the total available land area. Thus, the opportunity to increase production can be achieved by utilizing an area of unmanaged land of 98.99% or around 11,582 ha (Maluku Marine and Fisheries Service, 2016). One of the adaptation efforts that will be carried out through this project is the development of alternative economies by utilizing coastal economic resources such as aquaculture and seaweed. Alternative economic development will create a new source of livelihood and income for the community, especially the group of women who so far have no room for participation in improving the level of the family's economy. Women's community will be actively involved in the development of alternative economies, because women and children have high vulnerability due to the effects of climate change.
35. Seaweed needs have been growing year by year. This increase is due to demand for foreign and domestic markets. Indonesia's net profit between 2010-2014 rose from 3.92 million tons in 2010 to 1008 million tons in 2014 or increased by 27.29 percent per year. Although indonesia's growth in seaweed production continues to increase, there are problems with crop management systems and the capacity of human resources. Therefore, the provision of manufacturing tools of seaweed coupled with increased capacity for cultivation and for the cultivation of seaweed, should increase the selling value of seaweed. In addition, the procurement of Cold Storage which serves to maintain the freshness of fish, is expected to contribute to an increase in the selling value of fish catches of fishermen (especially tuna) up to Rp 12,000- up to Rp 20,000 / kg.

Social Benefits

36. One of the key capital of human resilience and adaptation capability in the context of climate change. Project components prepare the need for increased knowledge, skills and abilities of communities in adapting. Improved institutions at the level of fishermen, young men and women (housewives) are a revealing condition that must be prepared to achieve project goals. Socially, the project will open up social-participation spaces throughout communities that are compatible with resilient and adaptable resilience from the effects of climate change.
37. Collaboration between stakeholders is the principle of the implementation of each project component that will be carried out, especially to maintain post-project sustainability. One indicator of the success of an institutional strengthening program is the ability of community groups to be able to access government, capital and market programs, as well as the ability to ensure the State / Village government programs are aligned with the target achievements of the project components implemented.

38. The participation of women to assit the husbands in meeting the family's economic needs places women at the expense of their daily activities and downtime. The role of women in fisherman's household is important to understand as contributing helps to alleviate the demand of daily necessities of the household (Hutapea, et al., 2012; Kruijssen et al., 2018) . Therfore, gender mainstreaming is an important aspect of project implementation. In this case, both men and women are equal partners to receive fair treatment to access resources, organize, participate, and benefit from all activities.

C. Explain or provide an analysis on cost effectiveness of the proposed project/program.

39. Based on the results of the study on the National Action Plan for Adaptation to Climate Change, overall Maluku Province is considered the most vulnerable region against the risk of coastal flooding, high waves and extreme weather.[20] The only way to address the impact of climate change is preparing anticipatory measures and increasing readiness to deal with the situations and impacts of climate change. Moreover, coastal areas are most vulnerable against such impacts and, therefore, the surrounding communities must be involved in climate change adaptation activities as they will be directly affected.
40. This project will prioritize programs that are urgently needed by the community in the project sites aimed at economic development, social capital, and environmental resilience, as well as address overall vulnerability against the impacts of climate change. The project activities address capture fisheries sector, maritime affairs, alternative economic development, and social resilience as interventions in dealing with climate change. Funding from this project will be effectively used with a budgeted structure of 20% to 30% for the development of soft skills and 70% to 80% for the physical development across the three Negeri. To increase the direct benefits of the program budget for the community, we strive to implement a labor-intensive development system with local communities in the three Negeri. Developmental materials obtained from local potentials will be prioritized for empowerment and the workers from the local communities will be prioritized for recruitment. In this project, government participation and support will prioritize the promotion of program sustainability, by integrating the project with village development programs.
41. Coral reef restoration in this project is deemed the top priority for rehabilitating underwater ecosystems, especially shallow marine waters, and will contribute to the capture fisheries sector and improve the economy of the community. There are considerations from costs of recovery and rediscovery of coral reef, which also offer economic benefits. The average cost for making breakwater is higher than the recovery of coral reefs, meaning that the coral reef restoration will better prevent the impacts of loss caused by waves.

Component 1

42. Will provide be beneficial for the community of the three Negeri, particularly fishermen groups. With the availability of the catching season calendar and the new *fishing ground*, the pattern of circulation and migration of fish can be identified, thus reducing the risks of swelling operational fishing costs. Increasing the capacity and readiness of fishermen

[20] National Action Plan, Ministry of National Development Planning/National Development Planning Agency (BAPPENAS), 2014, p. 25

to adapt to climate change and reinforcing the fishermen institutions will also better guarantee the continuity of sustainable capture fisheries.

43. Satellite Remote Sensing (SRS) technology combined with fish circulation analysis is an effective method and technology that can reach a wider area compared to other methods and technologies. Using this method, program outputs will be more optimal and cost-effective. For a more economical alternative, it can be conducted through Landsat ETM+ remote imaging method without clarifying the field condition. By only combining data utilizing existing traditional knowledge, the process can reduce project expenses by 30% from the proposed budget, but the prediction may be inaccurate as there is no recent data comparison available.
44. As for the FAD which will be built, there are two estimate options as an alternative to intervention which is to use fiber materials or with traditional FAD made of wood/bamboo and and tied drums. They both have the same function. Only for plastering resistant wood/bamboo materials, it will not last long for high seas 1 to 3 meters around high-water fishing grounds of 3 negeri, although at the cost, traditional sources will probably cost less than 25% of the budget. In addition, in terms of government standards, environmentally friendly FAD will be applied.

Picture 10. FAD Type

Modern FADS with fiber material

Traditional FADs with wood / bamboo and used drums material

Komponen 2

Project component 2 offers economic benefits to the community with new fishing grounds, as a form of adaptation to ecosystems in shallow marine waters. The problem regarding food vulnerability will be addressed with the availability of food sources originating from the sea that are resilient against the impacts of climate change. As for the long-term benefits, already-productive coral reefs can be further utilized as ecotourism that can add economic value to the community.

45. Coral reef restoration method through transplantation technique may be deemed effective and economical, as well as may require shorter period of time. In using this method, it must be ensured that the substrate used is resilient enough to withstand the undercurrent. To anticipate the condition, this program will duplicate the technique used by communities in other Negeri who have done the same. There are other methods that may work better, such as *Artificial Reef* or manmade coral reef, performed by submerging the artificial concrete for coral reefs to naturally grow on. This method has significantly more advantages, but requires 40% more cost.

Picture 11. Coral Reef Restoration Method

Sumber Gambar: Songulara.com

Coral reef restoration using substrate net transplantation method

Sumber Gambar: bussinessmirror.com

Coral reef restoration using artificial coral reef method (artificial reef)

Komponen 3

will lead to the development of new innovations in terms of creating alternative livelihoods that are climate resilient by implementing a number of strategies to increase income and skills in managing marine products.

46. The development of grouper pisciculture through kellong pool made from woods and bamboos, as well as drum as floater. These materials are considered economical in nature, though sometimes requiring extra maintenance. Woods and bamboos are, at the most, only able to last 2-3 years. There are several choices of modern materials available in the market, for example, fiber or High Density Polyethylene (HDPE) materials. The installation is also relatively easy and such materials are strong as well as limber, making it wave-resistant (2 meter high). HDPE materials can last until 20 to 50 years under regular maintenance. However, the cost for materials, installation and maintenance is at least 20% higher than the proposed budget.

Gambar 12. Type of Floating Cage

Picture Source : infoikan.com

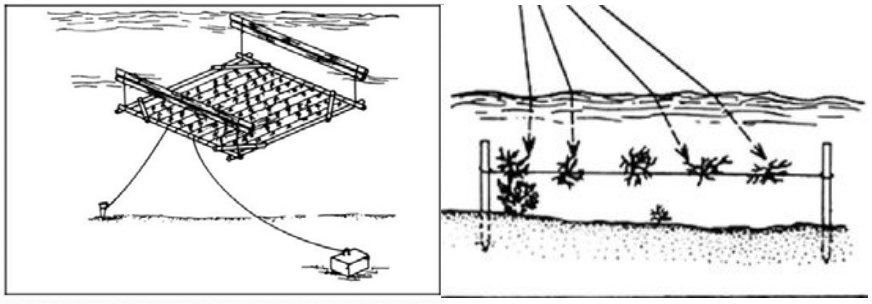
Examples of traditional floating net cage with bamboos and drums

Picture Source : coolboxindonesia.com

Example of modern floating cube cage "*interlocking system*" made of HDPE materials

47. There is seaweed farming using floating raft technique. This technique is preferred as it is easy to apply for seaweed farming in waters with sufficient depth, such as in three Negeri, aside from its cost-efficient quality. There are other viable methods, such as off-bottom monoline or long line method, which is more location-dependent and can cost 25% more from the proposed budget. Such cost is more commonly used for installing anchor to knot the polyethylene rope where seaweed seed will be sown. Aside from problem with the cost, this technique is only considered suitable for waters at under 1.5 meter of depth.

Picture 13. Seaweed Cultivation Techniques



Seaweed cultivation using floating raft techniques

Budidaya rumput laut dengan teknik lepas dasar

Component 4

Component 4 will be beneficial for the community, particularly those who live on the coastal area and the seafront. Construction of breakwater or wave-breaking walls is the fastest alternative to reduce the impact of climate change.

48. this program is repairing + 500 M of damaged breakwater along the shoreline of 3 Negeri, which will only prioritize the most vulnerable points in order to support the community activities. The proposed budget will be adjusted according to the needs, as well as to educate the communities on how to protect breakwater and the coastal areas from waves by culturing coral reefs in front of breakwaters with high risk of damages and by

planting mangroves to prevent abrasion. As a comparison, there are several techniques commonly utilized to prevent high tides from damaging breakwaters. For instance, it can done by installing tetrapod[21] in front of breakwater, which cost 50% more than the proposed budget.

The challenges encountered in the field are (1) the lack of public awareness to safeguard the sea as a sustainable resource, (2) the lack of knowledge on the management and utilization of existing resources, (3) limitations on equipment and technology used by fishermen that affect the expected yield, (4) the community's ignorance on the impacts of climate change which will make it difficult in identifying problems occurring in the field.

[21] Tetrapod is a type of structure utilized in coastal engineering in order to prevent erosion caused by weather or shoreline changes, especially for erecting coastal structures, such as seawall and breakwater.

Table 7. Summary of Project Costs and Benefits

Project Component	Project Cost USD	Concrete Benefits from Adaptation	Avoided loss	Alternative Interventions and Compromise
Strengthening the adaptation of traditional fishermen in facing changes fish migration and circulation patterns due to climate change	**231,544.78**	• Increasing the resilience of fishermen in dealing with extreme weather by identifying fishing season patterns and new *fishing ground* locations • Increasing fishing catch • Reducing the sailing risk emerging due to bad weather • Reducing fuel use • Cutting down the time required for searching *fishing ground* locations • Knowledge on the patterns of migration and circulation of fish in the sea • Fishermen group institutions that are established and capable of collaboration with relevant stakeholders will procure support for adapting against the impacts of changes in the pattern of migration and circulation of fish • Maintaining the economic value of fishing catch	• Extremely high fuel consumption which burdens fishermen • Income decline experienced by fishermen due to difficulties in finding fish • The economic downturn affecting other sectors • Fishing activities are abandoned	• Relying on the traditional seasonal calendar in determining the *fishing ground* locations. *Trade-off*: - Regional maps and traditional seasonal calendars are irrelevant and speculative - Seasons are becoming more and more unpredictable, making it difficult to study fishing season - Fishermen could not obtain the optimal fishing catch - High operational cost due to indeterminate fishing grounds • Fishing grounds are determined by fish wholesalers: *Trade-offs*: - Relying on the instructions from fish wholesalers - Fishing tools are not compatible with the condition in the fishing locations - Swelling debts to fish wholesalers - Sailing trip is done in group and led by a fish wholesaler • Fishermen are not organized through an established institution - Minimum support from the village/Negeri government and the Local Government - Budget allocation structure in DAD isn't adaptive to the climate change

				- Lack of supports in preparing the community for challenges emerging from fish migration and circulation. • The limited *number* of cold storages *Trade-offs* - Fish freshness quality is not preserved - Decreasing sales value for fishing catch, which is not balance with the sailing operational cost - Steep increase in the local government budget allocation following the realization of cold storage procurement.
Coastal ecosystems repair for the resilience of communities and alternate location for source fishing	**134,123.13**	• Increasing the number of fish habitats in shallow waters, which may be utilized alternative fishing areas, if and when sailing poses too high a risk • Coral reefs are well preserved and could serve as breeding location for marine biotas • Damaged coral reefs ecosystem is recovering • Potential and new alternative livelihoods with the development of ecotourism program • There is a room for participation and empowerment for youth groups to save coral reefs in concert with other stakeholders	• The damage of coral reefs ecosystem is worsening. • Diminishing habitat for various pelagic fish (fish that live in shallow waters) • Higher degree of vulnerability that the environment faces as coastal ecology are damaged.	• Fishermen's overreliance on fish sources in deep sea *Trade-offs*: - Risk of extreme climate and proneness to accident during sailing activity - Ever-increasing operational cost for sailing • The damage of coral reefs ecosystem is constantly aggravating *Trade-offs*: - Diminishing alternative sources for catching fish in shallow waters - Tidal waves will be stronger and more intense, which are capable of destroying the breakwater structure - Diminishing quantity of marine biotas and fish food sources - Inability to use the resources available in shallow sea waters - Decreasing support capacity in the coastal ecosystem • Declining awareness on the impacts, risks and benefits of coral reef ecosystem

				- Ever-increasing practice of dynamite fishing. - Growing number of unemployment among youth or productive age group
Alternative economic development in coastal areas that are climate-resilient by utilizing technology in fisheries and Marine areas	**296,712.69**	• Increasing sources of livelihood from maritime prospects • Increasing product diversification sourced of various marine and fishery commodities • Improvement in household economy. • Improving public knowledge on how to process fishing catch and marine products as food sources and trade commodities • Reducing poverty rate • Increasing participation of women group in their family economy	• Community dependency on capture fisheries • The potentials of natural resources are not well managed • The existing resources are not sustainably managed (*Sustainability*)	• Higher dependency on sources of income from capture fisheries *Trade-offs*: - Income earned are far from sufficient to cover for the family economy needs - Suffering from debt with the fish wholesalers when sailing is not possible - Higher rate of poverty and unemployment • No room for women group to participate in improving their family economy *Trade-offs*: - Plummeting family's standard of living - Overreliance on husbands' job as the only source of family income
Development of supporting facilities to anticipate the impacts of coastal flooding and tidal waves	**141,238.81**	• Increasing resilience to the risk of abrasion along the coastal areas • The village road and other facilities are protected from danger of waves • The dwelling of the local people are averted from disastrous high waves • Maintaining the economic value of fishing catch	• Frequent coastal flooding sweeping the settlement of the community along the coastal areas • The damages to or the loss of fishing boats following the occurrence of high tides • Village road access is destroyed	• The breakwater is severely damaged due to climate condition, coastal flooding, and tidal waves. *Trade-offs*: - The risk experienced people living in the coastal areas - Increasingly high disaster risks - Increased budget the government needs to allocate in addressing the impacts post-disasters

D. Project consistency with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

49. This project will always be synergized with the National Action Plan for Climate Change Adaptation (RAN-API) which has been designated by the National Development Planning Board (Bappenas) as a part of Indonesian national development framework applicable to the *climate proof/resilient development* concept. Project to be implemented in the project site will be integrated with the climate change and sustainable development adaptation *roadmap* that the Government of Maluku Province has owned, and during program implementation collaboration with the Local Government will always be done, particularly with the Regional Development Planning Board, and the Maritime Affairs and Fisheries Office of Maluku Province and Central Maluku Regency. Coordination and support for this program plan can be found in letter of support of the Maritime Affairs and Fisheries Office of Maluku Province and Central Maluku Regency (enclosed).
50. As for the directions of this action plan are 1) Adaptation of the strategy, policy, management, technology, and behavior to reduce (negative) impacts of climate change to its minimum level, and when possible utilize and maximize its positive impacts. 2) Efforts to reduce impacts (consequences) of climate change, both directly and indirectly, continuously or discontinuously or permanently, as well as its impacts by degree22. To achieve this objective, this program will always be synergized with the climate change and sustainable development adaptation roadmap that the Government of Maluku Province has owned, and RAN-API which has been designated by the National Development Planning Board (Bappenas). In its implementation, the program will always collaborate with the Local Government, particularly with the Regional Development Planning Board, and the Maritime Affairs and Fisheries Office of Maluku Province and Central Maluku Regency. Coordination and support for this program plan can be found in letter of support of the Maritime Affairs and Fisheries Office of Maluku Province and Central Maluku Regency (enclosed), and support from three Negeri Government Administration in the project site (enclosed).
51. **Ecological Resilience:** In ecological resilience sector within the national action plan, Bappenas sets forth its targets, which are, 1) Reducing the size of damaged natural ecosystem in land and sea caused by extreme climate and climate change, 2) Increasing the quality and quantity of coral reefs, 3) Reducing degree of endangerment faced by key species as the result of climate change, 4) Enhancing the ecosystem resilience system. The Ministry of Maritime Affairs and Fisheries has a strategic plan for rehabilitation of coastal areas All of these targets are outlined as outputs in this project activities, there will be 12 ha coral reefs to be restored and, further, this project will form 3 care-for-coral reefs communities equipped with organizational knowledge and building. With the recovery of the coastal ecosystem, there is a high possibility for sustainability for the key species, in which case, also supports the livelihood of the fishers as well.
52. **Economic Security and Food Security:** the targets of the government in food security sector is to reduce food production loss due to extreme climate and climate change, to develop areas where new sources of food production are found in particular areas with low climate risks and minimum environmental impacts (low emission), and to

[22] Bappenas, *the National Action Plan for Climate Change Adaptation (RAN-API) the Ministry of National Development Planning/National Development Planning Board (BAPPENAS)*, 2014. p. 12

develop food security system for farmers/fishers and community (micro) by promoting healthy and nutrition-balanced dietary pattern, and to achieve food diversification at the optimal level. Along with this project, various systems and technologies in capture fisheries, cultivation, and aquaculture management, seaweeds, and its derivative products are to be developed, which, aside from giving beneficial values, also provides economic values to foods. Better product diversification from the fishermen catch will strengthen their food security in any climate condition, and it also serves a true realization on adaptation to environment.

53. **Infrastructure Resilience:** For infrastructure resilience, the targets the government set in this national action plan are 1) to develop an infrastructure resilience concept which is adaptive to climate change, 2) to build facilities with adaptability to climate change, 3) to provide and adapt infrastructure that has direct impact to the health of the community with high accessibility level, particularly for the community group who are both vulnerable and invulnerable to climate change, 4) to manage the integration of infrastructure layout with spatial planning within the concept of sustainable development. In this project, the output also covers some objectives, some of them are the breakwater construction and additional supporting facility for the fishermen, such as the cold storage. Ministry of Public Works and the Ministry of Maritime Affairs and Fisheries has strategic plan from is the development of facilities and infrastructure disaster mitigation and climate change in coastal areas The breakwater construction planned in this project is not relatively big. Nevertheless, this project prioritizes on areas that will be directly affected by bad climate in some villages, such as Batu Lubang. This project will certainly require the support of the government in various manners to ensure maximum achievement.
54. **Fishery Sector:** In fishery sector, the government mission is to have fishery resources that are resilient to risks of climate change and have the capability of continually adapt to and shall become the alternative livelihood for the community, the productivity and diversity of the water ecosystem, and the fishery sector in general. This project intervention is consistent with the government objective of introducing fish culture technology using aquaculture system, and increasing *sustainable* productivity of ecosystem diversity.

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E. Project's relevance to meet national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund

National Standards

55. This project will follow the technical standards based on the direction and policy in the National Action Plan for Climate Change which has been designated by the National Development Planning Board (Bappenas), the climate change and sustainable development adaptation *roadmap* owned by the Government of Maluku Province, and the local and national policies, both existing and future policies. The implementation of this project will involve individuals who are knowledgeable and have expertise in their fields (*Experts*) to ensure the success of the activities being proposed. These experts will attend all activities from the beginning until the completion of the project which will be run by the contractor and the community

Table 8. National Standard Guidline/Relevant National Laws

Program	National Technical Standard

Project Component 1:	- As per Constitution of Republic of Indonesia No. 32/2009, the utilization of natural resources must be in balance with environmental function. - UU No. 31/2004 about Fisheries. UU No. 45/2009 about Fisheries. Fisheries Act, article 7 and 9 dictates the Ministry of Marine Affairs and Fisheries to regulate the following: - type, amount, fishing tool size (Article 7, item f); type, amount, size, and fishing equipment placement (Article 7, item g); - area, lane, and time or fishing season (Article 7, item h); - terms or standard operation procedures for fishing (Article 7, item i); - weight or minimum weight of certain type of catchable fish (Article 7, item q); - condition of fishing equipment and/or fishing aid that is able to disrupt and damage the continuity of fish cultivation (Article 9, paragraph (2). - Ministerial Decree KP No. 06/MEN/2010 about Fishing Equipment in Indonesian Fishing Waters. - Law of Ministry of Marine Affairs and Fisheries No. 47/Permen-Kp/2016 Regarding the Utilization of Water Conservation Area - Law of Ministry of Marine Affairs and Fisheries No. 26/PERMEN-KP/2014 of FADs
Project Component 2	- The Law of Ministry of Marine Affairs and Fisheries No. 6/Permen-Kp/2017 Regarding the Organization and Working Procedure of Marine Affairs and Fisheries - As per Constitution of Republic of Indonesia No. 32/2009, the utilization of natural resources must be in balance with environmental function. - Ministerial Decree No. KEP.38/MEN/2004 Regarding General Guide on Coral Reef Management. - Coral Reef Rehabilitation Guidelines: the Directorate Conservation and Marine Ecosystem. Directorate General of Nautical Management. Ministry of Marine Affairs and Fishery, 2015. - UU No. 31/ 2004 on Fisheries. UU No. 45/ 2009 on Fisheries, article 7, item N, P, and R.
Project Component 3	- The Law of Ministry of Marine Affairs and Fisheries No. 6/Permen-Kp/2017 Regarding Organization and Working Procedure of Marine Affairs and Fisheries - UU No. 45/2009 on Fisheries, point 22 article 46 Paragraph (1) - Components to complete prior to production process (fishing/cultivating). Several steps to follow in pre-production are as follows: No Step Pre-production Fishing Step Pre-production Fish Cultivation 1 Fishing Business Permit (SIUP) (article 26 UU Fishery) Fishery Business Permit (SIUP) (article 26 UU Fishery) 2 Fishing Allocation Investment (APIPM), etc. (article 5 paragraph 2 PP Fishing Business) environment permit through AMDAL Document/UKL-UPL (article 22-41 UU Environment Safety and Management) 3 Fishing Permit (SIPI) (article 27 UU Fishery) conducting risk-free environmental analysis (article 47 UU Environment Safety and Management) 4 Fishing Vessel Permit (SIKPI) (article 28 UU Fishery) establishing open-area fish cultivation on conservation area (article 32 PP Fish Source Conservation) 5 environmental permit through AMDAL Document/UKL-UPL (article 22-41 UU Environmental Safety and Management) 6 conducting risk-free environmental analysis (article 47 UU Environment Safety and

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	Management) 7 establishing open-area fish cultivation on conservation area (article 7, 30, 31, 32 PP Fish Source Conservation). - 12 article 2-3 UU No. 45 year 2009 states that it is forbidden to perform fish cultivation, be it genetically engineered or not, which is potentially harmful on fish resources, fishing grounds and/or human health. Also, the government strictly forbids the use of drugs in fish cultivation which may endanger fish resources, environment and health.
	- The Law of Ministry of Marine Affairs and Fishery No. PER.01/MEN/2007 on Quality Control and Safety of Fishing Yields. - Decree of Ministry of Marine Affairs and Fisheries No. KEP. 07/MEN/2004 on Fish Seeds Acquisition and Distribution. - Decree of Ministry of Marine Affairs and Fisheries No. KEP.02/MEN/2007 on Suitable Fish Breeding Method. - Decree of Ministry of Agriculture No. 26/1999 on National Seeds Development. - Indonesian National Standard SNI 7672-2011 (seaweed seed colony) SNI 7673.1-2011 (LK-off-bottom monoline method) SNI 7673.3-2011 (seaweed seed production) SNI 7673.2-2011-produksi LK-met.longline
Project Component 4	This project follows national standard which is stipulated in the Circular Letter of the Ministry of Public Works No. 07/SE/M/2010 Regarding Lifeguard Construction Guidelines.

56. Project 4 components aim to repair the existing seawall, which is damaged due to the impacts of heavy tides and abrasion, as this has been the focus of the previous Environmental Impact Assessments (AMDAL). However, if it is deemed necessary to conduct reassessment, project organizer will apply for AMDAL Business and/or Activity Permit or Environmental Management Plan and Environmental Observation Plan (UKL-UPL). The Scope of Government Regulation for Maritime Buildings and Structures are:
    a. the types and criteria for Maritime Buildings and Structures;
    b. the requirements and mechanism for erecting and/or constructing Maritime Buildings and Structures;
    c. the procedures for dismantling and/or Maritime Buildings and Structures;
    d. monitoring and evaluation procedures.

In implementing environmental preservation and management as the prerequisite for obtaining Business and/or Activity permit. will consider the applicable provisions related with the guidelines for constructing coastal protection structures in accordance with the Circular of the Minister of Public Works No. 07/SE/M/2010, in order to ensure that the construction of coastal protection structures adheres the applicable structural requirements and methods.

Every contractor and subcontractor, as well as any suppliers designated to perform the work must obtain any permits related with the work, such as heavy equipment transportation permit and operational permit for heavy equipment with axle load on public roads, according to Regulation No. 14/1992 on Roads and Government Regulation No. 41/1993 on Road Transportation. In project implementation will

comply with the regulation about Workplace Safety and Health (Keselamatan dan kesehatan kerja or K3). Application of K3 management according to the Regulation of Minister of Labor No. 05/Men/1996 on Workplace Safety and Health Management System and Regulation No. 13/2003 on Employment, The Regulation of Minister of Public Works No. 09/PRT/M/2008 on the Guidelines for Construction K3 Management System for Public Works

Environmental and Social Policy of the Adaptation Fund

57. This project implementation is committed to all environmental and social policy and regulation of the Adaptation Fund. Before implementing the project's activities, a process of identifying environmental risks and social risks will be carried out. Every risk will be identified in the beginning to prevent and/or minimize potential issues that may arise during project implementation. In addition to it, throughout project implementation a plan will be mapped out to prevent and/or minimize potential issues that may arise. There will be a mechanism to manage the occurring risks. Project implementation will comply with the national and international laws.
58. This project will be implemented by involving all communities in three Negeri. Particularly for the fishermen community, as they will actively involve in improving their sailing knowledge. Additionally, full participation of the youth community is also promoted to ensure the success of restoring the submarine ecosystem, in which case, it will ultimately support other activities. For women community, the activity is aimed to develop an alternative economy program, which will be executed in three Negeri. Women community is most catered to in this project since they have the highest vulnerability level. All results achieved from this activity can later be experienced by all communities in three Negeri and they can finally adapt to any risks emerging from climate change.

F. Describe if there is duplication of project / programme with other funding sources, if any

59. However, the HAI partner (Tifa Institute Tifa Damai Maluku) as the main partner in the implementation of this program has done a lot of work to empower coastal communities in Central Maluku Regency in the form of policies on management of marine and coastal resources based on adat and local wisdom (marine SASI), including how to improve the economy of coastal communities in fishery and non-fishery sectors.At present, no similar program / project in the project location will be developed in this proposal. At present, no similar program / project in the project location will be developed in this proposal. But, several similar projects that have been carried out in other locations and will be duplicated in this AF project and take lessons from the best practices are as follows:

Fishing Ground

Project	Mapping of Fishing Ground Location and Fishing Utility Status in Selat Madura
Project Location	Selat Madura
Project Date	2008 – 2009
Committee	Teaching Staff of Marine Study Program, Trunojoyo University and
Lesson	The goal of this project is to find fishing ground quality mapping to predict fishing ground, determine fishing ground mapping from water quality parameter, test fishing ground model requirements, and analyze catch per unit effort (CpUE) as well the status of

	fisheries utility in Selat Madura. This project used interpolation analysis method on combinations of satellite imaging, field, and secondary data in order to obtain new data in the form of fish population, potential maps, and fishing grounds location.

Coral Reef

Project	**Coral Reef Rehabilitation in Pulau Sangiang**
Project Location	Pulau Sangiang, Desa Cikoneng, Kecamatan Anyer, Kabupaten Serang, Provinsi Banten, Indonesia
Project Date	2017 – 2018
Committee	Ltd. Asahimas Chemicals, KEHATI Foundation, TERANGI Foundation
Lesson	In the project location, coral reef has undergone *bleaching* due to environmental change, according to *baseline* survey. KEHATI and Asahina Ltd. have found several cases of sedimentation, trash deposit in the deeper base of the Island, which are suspected to have happened from sedimentation, waste disposal, and anchors disposal. Dead and hardened coral reef, as well as stressed coral reef, are also found in many locations. Coral reef transplantation is one of methods for recovering the coral reef ecosystem in Pulau Sangiang, which involves local population in monitoring and preserving coral reef and island ecosystem. This project invites various business parties to help preserve ecosystem.

Floating Raft

Project	**Mitigation and Climate Changes Adaptation**
Project Location	Desa Tarantang , Kabupaten Kotawaringin Barat, Provinsi Kalimantan Tengah
Project Date	2017 – 2018
Committee	*Indonesia Climate Change Trust Fund(ICCTF) and Indonesian Orangutan Foundation (Yayorin)*
Lesson	The program holds the missions to respond to climate change by helping impoverished fishermen who live in surrounding floodplain adapt to the climate change. Keramba, which is made from nets and floating bamboos, are filled with fish seeds to be used in this project.

Seaweed

Project	**CSR Pupuk Kalimantan Timur (PKT)**
Project Location	Kampung Malahing, RT 30 Kelurahan Tanjung Laut Indah, Kecamatan Bontang Selatan, Kota Bontang
Project Date	2017 – 2018
Committee	Pupuk Kalimantan Timur (PKT) and Malahing Villagers
Lesson	Around 50 to 60 heads of households were allotted financial and skill aids from CSR PKT in order to foster seaweed cultivation business in Malahing community. Now, seaweed has turned into villager's main income. Fishermen used to catch fish and sea cucumbers in this area. Seaweed species suitable for Bontang's waterlogged area is Tonii *(Eucheuma Cotonii)*. It is whitish in color, transparent, and has chewy texture. Malahing seaweed can be processed into seven types of seaweed derivative

	products, such as seaweed stick, amplang, kembang goyang, ceker *snack*paper, cheese pilus and syrup. These are done by PKT development partner, Joint Business Group (Kube) Sukses Mandiri.

Breakwater

Project	**Village Innovation Program**
Project Location	Desa Telaga Biru di Kecamatan Tanjung Bumi, Kabupaten Bangkalan, Madura, Jawa Timur
Project Date	2017 – 2018
Committee	Dirjen PPMD and Kemendes
Lesson	Breakwater rehabilitation project using cast concrete is made necessary due to repeated abrasions on the breakwater. Several parts of breakwater are weather-beaten, thus unable to achieve maximum efficiency. Villagers have reached the conclusion to replace materials construction with unused tires. Telaga Biru is the only village with a harbor in Madura, which is called Sarimuna Harbor. Because of that, there are many used tires in Telaga Biru. Total number of used tires is on hundreds. To prevent the unused tires from becoming pathogenic breeding ground, each village chief ordered the people to collect discarded tires and construct breakwater using them.

G. *Learning and knowledge management components to capture and disseminate lessons learned.*

60. The new experiences and lessons learned from this project will be promoted based on the achievements of project that are implemented in Negeri Asilulu, Negeri Ureng and Negeri Lima. The experience and lessons learned will be disseminated in concert with Institute Tifa Damai Maluku, through a collaboration with the Regional Government and the Climate Change Adaptation Forum and Maluku's Disaster Risk Reduction (APIK-PRB). The Learning process and Knowledge will be promoted as a model feasible to develop for other Negeri, particularly those across the coast of Central Maluku and Maluku in general. The learning and knowledge generated from this program will be presented in printed materials, visual and audio visual documentations. Promotion through printed documentation can summarize what activities to carry out for the success of the project so that the public can collectively learn from them. The dissemination can be done through social media and printed media. It is expected that the general public will learn through social media and printed media. Additionally, a documentary is to be made to accommodate the surrounding communities in the process of understanding and implementing what they learn. However, it does not rule out the possibility that the output of this project is applicable in other Negeri when supported by the government and other donors, if they wish to develop the project. Workshop activities will provide a room to share experiences with other communities in other Negeri. In addition, the workshops can also provide information for the government if they wish to support the community by issuing the appropriate policies.
61. other than that, The results of various activities, reports, research and studies will be summarized in a handbook module which can be used as a standard for climate change adaptation. Here are the forms of knowledge management:

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a. A technical handbook on climate change adaptation efforts in Negeri Lima, Ureng and Asilulu (Best Practice and success story)
b. Capture season information board and fishing ground location at the State office
c. An environmentally friendly fishing practice board and fishing gear
d. Provision of program information boards at State offices
e. Educational posters to the community about climate change information and forms of adaptation that can be done
f. Information boards at the location of ongoing projects
g. Information boards for types of seaweed cultivated
h. Rehabilitated coral reef information and education boardsSign up for catching calendar and fishing ground location information at the State office

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H. Describe the consultation process, including a list of consulted stakeholders, what happens during project preparation, with specific reference to prone/vulnerable groups, including gender considerations, in accordance with the Environmental and Social Policy of the Adaptation Fund.

~~61.~~62. Consultation processes at the regional level will be carried out with key stakeholders, beginning with the preparation of program proposal in collaboration with the Institute Tifa Damai Maluku, Fisheries and Marine Service of Maluku Province, Fisheries and Marine Service of Central Maluku District, Government of Negeri Asilulu, Negeri Ureng and Negeri Lima, including establishing initial communication with the Climate Adaptation and Disaster Risk Reduction (APIK-PRB) Forum where the Institute Tifa Damai Maluku serves as Deputy Chairperson. During the implementation phase, gender consideration will become an important issue that is mainstreamed in every activity in the field.

~~62.~~63. Initial consultation with the Maritime Affairs and Fisheries Office of Central Maluku Regency was conducted in November 2018. The discussion and consultation was done with the Head of the Maritime Affairs and Fisheries Office of Central Maluku Regency regarding development initiative on *Climate Change Adaptation Program for Coastal Areas and Small Islands Sector in Negeri Asilulu, Negeri Ureng, and Negeri Lima.* From the result of the discussion and the consultation, the Maritime Affairs and Fisheries Office of Central Maluku Regency provided a letter of support for this project.

~~63.~~64. In this project we have identified minority groups and communities that will be the object of the project by collaborating with local community organizations who are more familiar with the characteristics of these communities, including mastering their culture and customs. Consultation and communication as well as suggestions and input have been received through various representatives of the community, from fishermen groups, youth, and representatives of women's groups using the questionnaire method.

~~64.~~65. In implementing the project, the consultation activities involve a number of stakeholders, in order to support the RAN-API's vision and mission as a national target. **Local communities** are involved in key projects, problem identification, participatory mapping of potential vulnerabilities, and determining locations for implementing AF project. **The Regional Government and the Government of the Three Negeri** will be involved in providing data regarding community vulnerability, the potential for development, and possibilities for synergies in certain projects, providing training materials and reinforcing community capacity related to projects, mobilizing and planning follow-up programs post AF project. **Academics, research and development institutions** will provide technical support during project

implementation, starting from mapping potential *fishing ground* areas, studying seasonal patterns, fish circulation and migration, advocating priority points for coral reef restoration, fish farming with aquaculture methods, and seaweed farming. **Local non-governmental organizations** will provide support to the activities, such as the development of coral reef lover groups, seaweed farmers, and women's empowerment, as the technical implementer and community mentor.

Table 9. The results of Focus Group Discussion (FGD) for each Negery are as follows

Negeri Asilulu	
The villager and fishery polytechnic work collaboratively to ensure the fishermen's growth. Traditional fishermen remain using bubuh (traditional fishing tool) and other traditional equipment. Unpredictable climate directly affects fishing yield. Fishing grounds are located in the middle of the sea and, due to bad weather, fishing has become very dangerous.	
Proposed Programs	- There is a dire need for coral reef rehabilitation to encourage fish spawning in the coral reef. - Rehabilitation of breakwater has become top priority due to the fact that it has not been repaired for 10 years. - There should be alternative livelihood in case of unproductive fishing seasons. - Rumpung/Rumpon is a useful fishing method that uses small fish to bait for larger pelagic fish.
Negeri Ureng	
Proposed Programs	- Reliable seasonal calendar is required because the local wisdom alone cannot reliably interpret the climate condition. - Fishermen are very dependent on traditional fishing equipment, such as nets. The people is enthusiast for working groups if there was a business model that is more profitable. All this time business has been held by individual person. - There is Keramba project for fish farming. However, Keramba was carried by the water current due to improper placement. The project was put on hold due to financial issues and lack of fish seeds. - Not many people own Rumpung/Rumpon, which serves as the place for feeding and breeding small fish. - The disadvantage of fishing in this place revolved around tuna fishing ground. It is far in the middle of ocean, thus it is very dangerous to fish in certain months. - Seaweed farming is promising in the coastal area. However, there should be training for cultivation and processing so that people know how to process fish into ready-to-sell products. - Up to this day, the wives sell daily catch to Ambon and neighboring Negeri and there is yet to be any attempt to process the fish into a new products to bolster the selling price. Women's group wishes to attend training so that they could produce shredded fish or other fish-based products in order for the women's group to improve Negeri Ureng economy.

	- Up to now, caught fish is placed into boxes of ice to be transported to Ambon first thing in the morning. Fish can easily be damaged and lose value. - Seaweed farming location can be implemented in Nusaelat Village by adjusting to seasonal calendar. - Approximately 150m of breakwater in several elder villages, such as Diwaipula and Nusaelat, as well as in Chinese villages, is in dire needs of repair. - ADD 2020 has not yet been confirmed by Musrenbag so that no program can be synchronized. ADD 2019 has only reached step 2 and step 3 only focuses on small scale industry/individual business based on grant.
Negeri Lima	
Proposed Programs	- Business groups needs to be formed and reinforcement programs are required to establish a capable institution in order to safeguard and ensure business sustainability. - Coastal beach rehabilitation by planting sea almond as a way to prevent abrasion. - Market development for selling tuna and skipjack to prevent price markdown which occurs when only selling them to Ambon. - At this day, fishermen used to follow local wisdom in deciding where to fish as well as choosing the fishing ground. Thus, it is imperative to adopt modern knowledge so as to obtain the new fishing grounds. - There are two coral reef spots that have the potential to be tourist attraction. - New location research for seaweed cultivation should be developed. Farming group should be given cultivation technique training. - Fishermen's capacity needs to be improved so that fishing yield could be marketed well with high economic value. - There was supervisory by Kodam for 2 weeks, but without any training. People were given Keramba without fish seeds and the project came to a halt. - There is approximately 1km of breakwater in need of repairing. - As for now, the community is probing for the possibility of fishing vessels port location. When port is available, fish market would soon be developed.

~~65.~~66. The sustainability of the post-project results has been designed since the initial consultation with various parties, especially the community and the Village Government, some projects that can generate incentives or have economic value and can be developed will be encouraged to become Village-Owned Enterprises (BUMDes) where the Government through the Ministry of Village PDTT indeed sets four priorities use of village funds for 2018 namely the development of superior products in rural areas, development of BUMDes or BUMDes Bersama, embung, and other programs such as the development of superior products of the village including the tourism industry and the fish management industry that will be developed in this project. If it goes according to plan, this project will strongly

support the National target where the government through Permendesa No. 19/2017 concerning Priority in Using Village Funds 2018 allocates a large enough budget for the development of BUMDes. And of course projects that were started in this AF program will very likely be sustainable post-projects.

I. Justify the requested funding, focusing on the full cost of Adaptation considerations.

Harmony Foundation and Institute Tifa Damai Maluku expect full funding from the Adaptation Fund project, because other funding sources for this program are not yet available.

~~66.~~67. Maluku Province consists of small islands which are extremely vulnerable to the issue of isolation arising from the increasingly worsening climatic conditions. Maluku people are dependent on sources of food/provisions originating from Sulawesi or Java. So, as the climate condition worsens, the vulnerability level of the community will also rise. With 90% of population working as fishermen, the community in the three Negeri is extremely vulnerable to climate change, unpredictable pattern of fish circulation and migration, extreme weather, rising sea levels, and damages to coastal ecosystems, all of which affecting the fishermen's livelihoods. Economic and social costs rise due to declining catches and increasing difficulty in finding fishing locations. The majority of population do not have alternative livelihoods due to lack of knowledge required for developing diversification of economic value products. Experiencing such impacts, the degradation of coastal ecosystem quality and declining fish commodities are the root cause to fishermen vulnerability. Therefore, this project is proposed for the following reasons.

Component 1. Strengthening the adaptation of traditional fishermen in facing changes fish migration and circulation patterns due to climate change (without funding)

The absence of fishing ground map and updated seasonal calendar and also FDS (Rumpon), will cause the decline of fishermen's main fishing catch, which is tuna. The government will spend a large amount of money to increase the productivity of fishermen or new fishing technology or ships with greater capacity will be required. In addition, it also contribute to the decline of the regional income, even though according to *Destructive Fishing Watch* (DFW) Maluku is the largest contributor to tuna exports.

With funding for component 1, this project will help create a standard fishing ground map and a new fishing season calendar with the help of experts in the field of marine and climatology. This will be massively beneficial for fishermen and the government in achieving the target of developing capture fisheries in coastal areas. For the purpose of sustainability, this project can be developed in other regions. The existence of this project also helps ± 15,000 fishermen regain their confidence in their field of work, as well as their only livelihood. The allocated funding for the procurement of *cold storage* also helps fishermen or groups of fishermen in need. Increasing fishermen's income by maintaining the quality of catches delivered to buyers/traders will reinforce fishermen as fish producers and will increase sustainable regional income.

Component 2 Coastal ecosystems repair for the resilience of communities and alternate location for source fishing (Without funding)

Climate conditions cause coral reefs to break down and, as a result, the population of pelagic fish living in the shallow water decline drastically, while at the same time, the increasing risks of fishing due to strong winds and high waves discourage fishermen to go fishing. In some villages, fishermen who have economic alternatives such as trading, farming and gardening can still make a living in these conditions, but the people with no alternative livelihoods face difficult challenges to support their family.

With funding for component 2. Coral reef restoration is a basic intervention that will restore shallow water conditions in the hope that it will become a home for pelagic fish, so that fishermen can fish them for commercial purpose or consumption. The results generated from the components of this project will lead to improving people's livelihoods and resilience to climate change, economic improvement, food security, and the recovery of coastal ecosystems. New sources of livelihood will emerge along with a good ecosystem, which can support the community's economy. The target of achieving national and local government action plans is also accomplished by way of protecting and improving the structure, function and integrity of the ecosystem and its resources, as well as reducing the rate of coral reef degradation. In terms of social aspect, this project develops, maintains and improves the community support in an effort to manage coral reefs.[23]

Component 3 Alternative economic development in coastal areas that are climate-resilient by improving technology in the fishery and marine fields (Without funding).

Without funding on this project, the government has to work harder and allocate an enormous budget for capacity building and employment, which becomes the only solution for improving the welfare of coastal communities. With diverse resource potentials ranging from the land and sea potentials, the government must map the potentials of each village according to community capabilities.

With the funding for component 3, this AF project will serve as a massive assistance to resolve socio-economic issues of the community across the 3 Negeri, because at least there would be 3 groups of aquaculture farmers, 3 groups of seaweed farmers whose members have been provided with skills in nursery, management, harvesting and monitoring sustainable program under the guidance of experts and supervised by the regional government.

Component 4 Development of supporting facilities to anticipate the impacts of coastal flooding and tidal waves (Without Funding)

In 2014, almost all villages in Leihitu Sub-district were affected by tidal flood caused by rising sea levels, further aggravated by high waves causing water to flood into settlements. The government has restored breakwater in several villages, but the repairs were partial in nature and other causing factors, such as coral reefs and etc., were not addressed. The repaired breakwater only lasted temporarily and became damaged again in the long run. Despite requiring a large budget, the breakwater was ultimately repaired, considering that leaving the condition as it was would endanger coastal communities, especially those living at the seafront.

With funding for component 4, AF project will greatly help the government and local communities in reinforcing endurance and resilience against the impacts of extreme

[23] Research Center for Deep Sea (LIPI), *Ambon Bay Coral Reef Degradation and Rehabilitation Efforts in*, www.deepsea.lipi.go.id accessed

environmental changes. The funds will be used to complement the shortcomings of the government's endeavor, such as the most impactful damages on several villages, such as Batu Lubang, Negeri Asilulu Hitu, or Hila which are extremely vulnerable to coastal flooding. By aiming to reduce settlement vulnerability.

J. Describe how the sustainability of project/program outcomes has been taken into account when designing the project/program.

~~67.~~68. To ensure the sustainability of this program, we will promote the learning and knowledge model generated from this program to be adopted in the regional climate change adaptation action plan, including promoting the necessary local and regional policies, so that similar programs receive financial support from the region. The Negeri/Village Government will play an active role in the implementation of the project, such as:

a. Helps consolidate fishermen, custome/traditional figure, women (mothers) groups, and youth / young women groups to be actively involved in each stage of activities that have been designed in this project;
b. Make a polycies of Negeri / Village level that are relevant and can support the success of the project (For example: policies on ecotourism, protection of coral reefs, regulation of utilization of fishing ground areas;
c. Allocate funding to support adaptation programs in the Negeri Government Budget (For example: Provision of fishing gear for fishermen, ecotourism infrastructure development)

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Table 10. The role of the Negeri/village government and its involvement in the implementation of proposed activities

Component	Pre Project	Project Activity	Post Project
1. Strengthening the adaptation of traditional fishermen in dealing with changes in fish migration and circulation patterns due to climate change.	- To assist consolidate the groups of fishermen, traditional leaders, women (mothers) and youth to actively involved in each activity that have been designed in this project. - Involved in dialogue and consultation with the Department of Maritime Affairs and Fisheries of Maluku Province and Central Maluku Regency for preparation of fishing ground mapping, construction of rumpon, and formation of fishing groups.	- Involved in study and implementation of fishing ground mapping - Involved in the formation of institutional groups of fishermen and the registration of fishing groups to the Department of Maritime Affairs and Fisheries of Central Maluku Regency. - Budget allocation for fishing gear in the DAD allocation. - Together with the fishermen group, build the cooperation and support with the government to access the capacity building program for fishermen and or fishermen assistance program that have been budgeted by the Government in the APBD and APBN (for example: program for providing environment friendly fishing gear, cold storage procurement). - Facilitate cooperation between fishermen group with company. - Involved in determining the cold storage location.	- Fostering the fishermen institutional. - Budget allocation of fishing gear provision in APBN. - Formulate state-level regulation regarding the use of sustainable fishing ground zones (Collaborate with Tetua Adat) - Together with the fishermen groups build the cooperation and support with the government to access the capacity building program for fishermen and or fishermen assistance program that have been budgeted by the Government in the APBD and APBN (for example: program for providing environment friendly fishing gear, cold storage procurement).
2. Improvement of coastal ecosystems	- Involved in identification and consolidation of youth group that	- Involved in dialogue and consultation of coral reef	- Formulate state-level regulation regarding the

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for the resilience of coastal communities and alternative location of fishing source	will actively involve in coral reef rehabilitation	rehabilitation with the Department of Maritime Affairs and Fisheries of Maluku Province and Central Maluku Regency. - Involved in surveying the location of coral reef areas to be rehabilitated. - Involved in formation and fostering the youth groups that care for coral reef.	protection of coral reef areas, including the type of fishing gear that is allowed. - Formulate a policy on ecotourism and budget allocation to support the development of ecotourism infrastructure in the APBN. - Fostering and monitoring - Youth group that care for coral reef. - Collaboration with youth groups that care for coral reef to develop cooperation and support with fish storage companies for monitoring, care and or expand the coral reef rehabilitation area through CSR programs that found in the company.
3. Development of alternative economic in coastal area that resistant to climate by utilizing technology in fisheries and maritime field.	- Involved in identification and consolidation of floating cage fishermen group that will involve in floating cage cultivation. - Involved in identification and consolidation of women groups that will involve in seaweed cultivation and processing of fishery and seaweed products.	- Involved in surveying the location of floating cage and seaweed cultivation. - Involved in the formation of institutional groups of floating cage fishermen, seaweed cultivation and the registration of fishing groups to the Department of Maritime Affairs and Fisheries of Central Maluku Regency.	- Together with the floating cage fishermen group and seaweed cultivation group, build cooperation and support with government to access the capacity building program and or assistance program that have been budgeted by the Government in the APBD and APBN (for example: program for provision of fish seeds for floating cages,

			access to capital, provision of facilities and infrastructures for seaweed cultivation and post-harvest. - Budget allocation for the development of microeconomic businesses for processing fishery and seaweed products in APBN
4. Construction of supporting facilities to anticipate the effects of tides and tidal waves.	- Involved in dialogue and preliminary consultation with the Department of Public Worker of Maluku Province, The National Agency for Disaster Countermeasure of Maluku region. - Involved in identification and selection of contractor implementing talud development. - Involved in the discussion and implementation of Environmental Impact Assessment	- Involved in surveying talud damage point. - Organizing local workforce for project activity. - Monitoring of the implementation of talud construction together with the Department of Public Worker of Maluku Province	- Talud maintenance

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~~68.~~69. We will also encourage that climate change adaptation project is included in the Negeri or Village development plan that can be funded through the Village Allocation Fund (DAD) which is budgeted annually by the Central Government. In this project, DAD serves as a supporting element for realizing the program. Consultation with the village governments indicates that some programs can be conducted collaboratively, including Village Community empowerment activities that allow them to be aligned with coral reefs cultivation and marine products management training, which will be involving women and youth roles during the process. The maintenance and expansion of breakwater (Component 4) structures shall be monitored by all communities, State Government and Public Work Office.

~~69.~~70. For Sustainability of livelihood diversification activities (Component 3), The development of a various businesses will be strengthened through organizational briefing and the establishment of Village-Owned Enterprises (BUMDes), so that it is highly possible to maintain the development through village funding. Any fisherman organizations formed and provided with capacity improvement training shall manage several properties generated over the course of project. Further, the development of these properties will be conducted in collaboration with the office of fishery service and the relevant village institutions.

~~70.~~71. In relation to youth (Men and Women) community development, in post-project phase, the care-for-coral reefs (Component 2) youth community is expected to develop an eco-tourism concept, as other village models which have successfully applied this concept, by forming a youth group who had been trained in organizational issues, coupled with organizational strengthening, the group will focus on developing tourism potentials, both the existing ones and will-be developed ones. Certainly, to develop these new tourism potentials, ventures to mobilize supports from the government and investors are to be taken. Supports may be in the forms of capacity building, fund support, and tourism promotion. We will also promote to other potential donors for further development of climate change adaptation models in other places or if further program support is needed at the same locations.

~~71.~~72. Social Sustainability: This project was designed to consistent with the social framework of the Adaptation Fund. Communities in three Negeri will be actively involved in the project. Starting from project preparation, project implementation, and up to the completion of the project, the whole process will involve the existing communities. Active participation of the community in implementing this project ensures the sustainability of the project that, upon the completion of Adaptation Fund funding, it can improve community resilience against climate change.

~~72.~~73. Institutional Sustainability: The project also establishes institutions at the community level according to support the continuity of the project. The formation of these institutions aims to gain new insights, facilitates communication between communities, and more importantly juxtaposes the accesses needed by the communities in developing their institutions. Accesses in question are to establish cooperation with government institutions, from village government to the central government, private parties, and non-governmental organizations. It is expected that the cooperation between institutions and related stakeholders will enable accesses to technology, group guidance, capital, and others. As the institution cooperates with the regional government, they can formulate a joint DAD for the welfare of the community. In addition to facilitating institutions to obtain the

necessary access, the establishment of these institutions also aims to prepare the institutions to manage, maintain and preserve the facilities built during the project.

~~73.~~74. Financial Sustainability: One of the project components is the development of alternative economy through technology development in fisheries and marine sectors. Alternative economic development aims to respond to the issue society sustainability so that they do not depend solely on fishing catch or sea products. The full engagement of the communities across 3 Negeri in carrying out the project, especially in this output, will involve more women groups. This aims to facilitate women to not depend solely on their husbands' income, as it is highly dependent on fishing catch. In addition to increasing financial income, fishermen groups can use the new *fishing ground* map. That way, after the project is completed, they have better economic resilience in facing climate change.

~~74.~~75. Environmental sustainability: Through this project, the sustainability of the underwater ecosystem will be addressed with coral reef restoration activities as they are carried out by coral reefs youth communities. The restoration of underwater ecosystems will also affect other activities. For example, the presence of coral reefs close to the coast will expand the new *fishing grounds* in coastal water. Further, coral reef restoration will contribute to the success in making net floating cages, because coral reefs will provide new sources of food. Coral reefs can also reduce strong undercurrent due to increasingly high tides.

K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project/programme.

List of Environmental and Social Principles	No further assessment requirements for compliance	Potential Impacts and Risks – further assessment and management needed for compliance
Compliance with the law	Further compliance assessment is required	The result of this project, as well as its process, are consistent with many policies and regulations of the government of Republic of Indonesia and further support the government programs. But, Further compliance assessment is maybe required for some of the activities contained in the project component Activity (Example : FADs, Embankment/Talud Restoration, Floating Net Cages Waste Management)
Access and Equality	Compliance assessment during the implementation may be required	In connection with the process and result, as well as its benefit pertaining to access and gender equality, potential gender-based involvement in this project may require further discussion.
Marginalized and susceptible groups	Compliance assessment during the implementation may be required	Considering the initial context of this project to map out any groups involved in project activities or

		activity objectives, assessment is strongly advised during the implementation
Human Rights	Further compliance assessment is not required	Indonesia highly regards the significance of upholding Human Rights
Gender Equality and Empowerment of Women	Compliance assessment during the implementation may be required	Several projects indeed aim to empower the women groups' skills by providing skill training. Compliance assessment during the implementation may be required
Core Manpower Rights	Compliance assessment during the implementation may be required	Primary Employee Policy in this project is consistent with the Adaptation principle policy
Indigenous People	Compliance assessment during the implementation may be required	So far, there is no relevant conflict with any specific national, as well as local/customary regulation. In the event that any conflict arises, the project shall adjust to eliminate the conflict.
Forced resettlement	Further compliance assessment is not required	This project will strengthen local society adaptability.
Protection of Natural Habitat	Further compliance assessment may be required	Based on the initial assessment, this project focuses on the development of natural habitat protection. However, its implementation may require assessment
Biodiversity Conservation	Further compliance assessment is not required	One of the programs in this project focuses on the development and potentials of the existing biodiversity
Climate change	Further compliance assessment is not required	-
Prevention of Pollution and Efficiency of Resources	Compliance assessment during the implementation may be required	-
Public Health	Compliance assessment during the implementation may be required	Since there are numerous projects requiring active participation of the society, further compliance assessment during the implementation may be required
Cultural and Physical Heritage	Compliance assessment during the implementation may be required	Since the project location is strictly situated in waters and offshore areas, there is no cultural and physical heritage sites to be found
Field and Land Conservation	Further compliance assessment is not required	Potential location for this project object shall be evaluated prior to the project implementation

PART III : IMPLEMENTATION ARRANGEMENTS

A. ***Describe the procedures for project/program implementation***

~~75.~~76. **Government**

a**. Maluku Province Government:** Regional Planning and Development Agency (BAPPEDA) Maluku Province is a state agency at the province level that has the authority to prepare provincial development plans (frame work and budget), the Acting Head of BAPPEDA has endorse for the implementation of the proposed project

b**. Central Maluku Regency Government**: The of Marine Affairs and Fisheries (DKP) of Central Maluku Regency is a state institution at the Regency level that has the authority to hold government affairs in the field of marine affairs and fisheries at the regency level. The Head of the Central Maluku Regency DKP has endorse for the implementation of the proposed project

c. **Negeri/ Village Government**: Has the authority to regulate and implement government at the Negeri / Village level headed by the Negeri / Village Head. The Secretary of Negeri/ Village of Ureng, Lima and Asilulu has endorse for the implementation of the proposed project. The Secretary of Negeri / Village is the leader of the Secretariat of Negeri / Village.

~~76.~~77. **Implementation Agency :** Partnership for Governance Reform in Indonesia (Kemitraan) is a National Implementing Agency (NIE).

~~77.~~78. **Project Implementation Unit :** Harmony Alam Indonesia (HAI) Foundatian is a Project Implementation Unit (PIU) which responsible for the daily operation of the project and reporting to the Kemitraan. PIU will do it consisting of project coordinators (Executive Directur HAI), Project Office Manager, financial manager and financial staff. PIU will carry out key administrative and operational functions, including: a) developmentThe annual work plan; b) management and supervision of project component implementation; c)procurement, disbursement, and financial management; d) monitoring and evaluation (e.g.preparation of financial statements and annual implementation reports); and e) ensure compliance with Adaptation Fund Policy.

~~78.~~79. **The Project Coordinator (PC)** oversees the implementation of project component and is responsible for the development and implementation of the project work plan and budget and also in managing project resources and support staff. He/she implements the policies, regulations, and procedures approved by the Kemitraan for the project and outlined in the Operational Manual. The PC reports to and provides regular reports to the Kemitraan on all aspects of project activities.

B. ***Describe the measures for financial and project / programme risk management.***

76. The following table summarises the risks and issues of the proposed Project:

Risk Category	Risk Rating	Risk Description	Proposes mitigatian Measures
1. Project Stakholder Risk			
1.1. Local (Negeri/Village) Stakholders	Low	Stakholders (Local Fishermen, Women Group, Costume/Traditional Figure, Youth, NGOs) do not support the proposed scheme	An intensive awareness raising campaign, communication would be carried out to increase the understanding and following buy-in of the local communities. The Operational Manual of the Project will mandate that it will

			support only activities that comply with sound environmental and social safeguard policies. A program of alternative livelihoods is envisioned under the proposed Climate adaptation measures.
1.2. Government	Low	Political will of the government at the regional and District levels, and local government do not support the proposed scheme	The National Government has a National Action Plan for Climate Change Adaptation (RAN-API) as part of Indonesia's national development framework that applies to climate-resilient / resilient development concepts. The Provincial Government has a road map for climate change and adaptation to sustainable development
2. Operating Environment, Social and Financial Risk			
2.1. Dispute over fishing grounds in a new fishing ground area	Low		Discussing the renewal of traditional fishing rules in a participatory manner with all stakeholders
2.2. Pollution prevention and resource efficiency	Moderate	Talud construction uses sand, stone and cement material which has the potential to produce dust	Compliance with policies/regulations in the environmental sector
2.3. Access and equity	Low	access of women and vulnerable groups to get involved and benefit from project implementation	- Participatory resource management - The operational project will mandate gender mainstreaming in every activity implementation
2.4. Price changes on materials used for project implementation	Moderate-Low		Budget Review
3. Excecuting Entity Risk			
3.1. Capacity	Moderat-Low		- Assistance and capacity building by Partnership for Governance Reform in Indonesia (Kemitraan) - involvement of consultants / experts in project implementation
3.2. Fraud and Corruption	Low		Asistance, Monitoring and Audit

~~D.~~ ***C. Describe MONEV protocols and provide budgeted M & E plans***

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~~79.~~80. Monitoring and evaluation will be carried out periodically every three months by Program Advisors and Financial Advisors. The evaluation results will be used to provide guidance for improving the implementation of activities. Monitoring and Evaluation will be done by independent parties every year end or annually, unless

decided otherwise by Partnership and Adaptation Fund. The result of evaluation will be used as a recommendation for improvement and formulation of annual work plan and, when required, adaptation will be made following direction of the newest local/central government policies (if applicable).

M&E Activity	Frequency	Responsible	Cost

~~E.~~ *D. Result framework for project proposal, including achievement, target and indicator.*

See Table 10 and 11

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Table 10. Result framework for project proposal, including achievement, target and indicator.

Project Objective(s)	*Project Objective Indicator(s)*	*Fund Outcome*	*Fund Outcome Indicator*	*Grant Amount (USD)*
Increase the knowledge and ability of fishermen to deal with changes in circulation patterns and fish migration patterns	• One fishing ground map and fishing season calendar • 60 communities of 3 Negeri improve their understanding on the collaboration between traditional and modern knowledge • Fishermen operational cost while fishing decreased by 15% • Fishing catch increased by 20% • There will be at least 1 *Cold Storage* of 1000 kg capacity in every Negeri)	• Enhancement of the capacity and knowledge of fishermen' groups by adopting the climate change adaptation strategies. • Increasing the yield and quality of fish catches of fishermen as well as helping improving the traditional fish catching rules (Sasi Laut) • The improvement of fishermen's knowledge on accurate fishing ground and fishing season • Some fishermen work with relevant stakeholders	• There is an increase in fishermen fishing catch through the implementation of the collaboration between fishermen's traditional technology and recently-acquired technology. • These fishermen groups acquire certain technology access, technical support or capital support from related stakeholder	**231,544.78**
Improve coastal ecosystems for the resilience of coastal communities and alternative fishing sources for local fishing groups.	• 12 ha of coral reefs are recovered • 3 youth groups are formed to save coral reefs • Fishing catch increased by 20% • 1 restored Location can be further developed into ecotourism •	• An increase in the quantity of marine biota habitat • Coral reefs youth communities obtain specific knowledge on how to restore coral reefs	• *New fishing grounds* around the coastal areas are increasing	**134,123.13**

There is a diversification in the form of new sources of livelihoods, which are climate-resilient	• There will be at least 2 types of new livelihood, such as floating net cage fish cultivation and seaweed harvest • There will be at least 9 groups of net cages fish cultivation • There are at least 20 communities who possess seaweeds cultivation knowledge • Community's income increased by 20% from the result of aquaculture fish cultivation • Community's income increased by 20% from the result of seaweeds cultivation	• Alternative economy development groups encompass the knowledge about the alternative economy development of each negeri • There are some women groups who process the result of alternative economy to increase the economy sale value	• An increase in the economy income of the community • To develop alternative economy in each negeri • Each negeri has an authentic product • Women dependence on husbands' income significantly decreases	**296,712.69**
Decreasing risk of climate change impact leading to the vulnerability of the settlement	• There will be at least ± 500 M of breakwater/wave-breaking walls in the improved 3 Negeri • At least ± 800 lives in 3 negeri will be averted from the potential threats of tidal waves • At least, it helps protecting the ± 1,6 KM village road that lies along the seafront. •	• There are several restoration points of the breakwater in every negeri	• Breakwater restoration in 3 negeri is ± 500 M long • Cold storage in the coastal areas in every negeri	**141,238.81**

Table 11. Result Framework

Project Objective: **Improving the resilience of communities in 3 Negeri and strengthen their social resilience to the impacts of climate change**								
			Cumulative Target Values					
Results Indicators	Unit of measure	Baseline	YR 1	YR 2	YR 3	Frequency	Data sources/ methodology	PIU ; Responsibility for data collection
Increase catches of tuna fishing groups up to 30% (Component 1)	%	FGD with Ambon Province Fisheries and Maritime Services	5	15	30	Annually	Project Report	PIU ; Center for Statistics and Information of the Secretariat General KKP
Increase economic value of fishermen's catches up to 20%	%	Interview and data from the third Negeri	10	20	20	Annually	Project Report	PIU ;
Reducing operational cost of Tuna fishermen up to 40% (Component 1)	%	interview and Subair Desertation (2013)	10	20	40	Annually	Project Report	PIU ;
Increases up to 35% of potential fish catches in coastal areas (Component 2)	%	Survey and interview	-	25	35	Annually	Project Report	PIU ;
increase in community income derived from aquaculture and seaweed up to 40% (Component 3)	%	Survey and interview		20	40	Annually	Project Report	PIU ;
Reducing the dependency of 50% of fishermen on the livelihoods of capture fisheries (Component 3)	%	Survey and interview	-	30	50	Annually	Project Report	PIU ;
Increase readiness of beneficiaries on the impact of abrasion and tidal waves (Component 4)	target number of communities	Survey and interview	100	250	400	End of project	Project Report	PIU ;
Intermediate Outcome: **Adaptation of Coastal Communities**								
Changes in fishermen behavior in the use of fishing gear that is not environmentally friendly	% Target fishermen	Interview with fishing groups	50	75	100	Annually	Project Report	PIU ;

Increased public awareness of climate change and adaptation efforts	% of community target number % of female beneficiaries	Interviews with the community and women's groups	30 40	70 75	100 100		Project Report	PIU ;
Intermediate Outcome: **Coastal Ecology Rehabilitation**								
The recovery of coral reef ecosystems is at least 80% of the project target	Km Hectares	Data from the Office of Maritime Affairs and Fisheries in Central Maluku Regency in 2017 and the results of joint mapping	7	9	12	End of project	Project Report	PIU ;
Increasing awareness of young men and women rehabilitating coral reefs	% Target number of participants		30	60	90	Annually	Project Report	PIU ;
Intermediate Outcome: **Alternative Livelihoods Adaptation**								
Increasing the role of women in the family economy	% Target number of participants		30	70	100	Annually	Project Report	PIU ;
100 training participants target mastering the management and development of village business centers	% Target number of participants		100	100	100	Annually	Project Report	PIU ;
60 families can develop a seaweed cultivation business (women's community priority)	Number of target groups / households		60	60	60	Annually	Project Report	PIU ;
60 families can develop a floating cage business	Number of target groups / households		60	60	60	Annually	Project Report	PIU ;
Increased economic value of fishing fish for groups of fishermen	Rupiah value / kg		12.000,-	15.000,-	20.000,-	Annually	Project Report	PIU ;
Intermediate Outcome: **Infrastructure improvement**								
Talud rehabilitation along 500 M in 3 Negeri	M			200 M	500	Annually	Project Report	PIU ;

e. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and anexplanation and a breakdown of the execution costs.

80. The project budget and timeline is outlined in Table 12.

Table 12. Project Budget and Timeline

Invesment Category	Activities	Year 1	Year 2	Year 3	Total
Component 1 : Strengthening the adaptation of traditional fishermen in facing changes fish migration and circulation patterns due to climate change	**There is a map for the new fishing ground distribution points based on the circulation pattern and fish migration pattern, as well as updated fishing season calendar**				
	Study on the circulation pattern and fish migration and fish season calendar in the project site	$ 12,391.79	$ -	$ -	$ 12,391.79
	Reviewing the location and mapping the fishing ground	$ 47,854.48	$ -	$ -	$ 47,854.48
	Workshop for establishing the season calendar and map of the new fishing ground area	$ 24,399.25	$ -	$ -	$ 24,399.25
	Rumpon Procurement / Fish Aggregating Device (FAD)				
	Rumpon Procurement / Fish Aggregating Device (FAD)	$ 9,701.49	$ -	$ -	$ 9,701.49
	Provision of Cold Storage in each village				
	Survey and site selection for Cold Storage in 3 Negeri	$ -	$ 2,552.24	$ -	$ 2,552.24
	Construction/ intallation of cold storage in 3 Negeri	$ -	$ 11,305.97	$ -	$ 11,305.97
	Maintenance Cold Storage	$ -	$ 1,000.00	$ 2,626.87	$ 3,626.87
	About 150 fishermen (50 fishermen in each village) have new knowledge which is more relevant to the climate change				
	Strengthening institutional groups of fishermen in three Negeri	$ 19,650.19	$ 22,000.00	$ 1,831.15	$ 43,481.34

	Mentoring fishermen groups in the three Negeri	$ 25,410.25	$ 28,040.03	$ 22,781.07	$ 76,231.34
Total Component 1		**$139,407.45**	**$ 64,898.24**	**$ 27,239.09**	**$231,544.78**
Component 2 : Coastal ecosystems repair for the resilience of communities and alternate location for source fishing	**Rehabilitation of ± 12 hectares of coral reefs in Asilulu and Lima villages in order to expand new fishing grounds near the beach**				
	Consultation with Regional Government and the relevant Office of Marine Affairs and Fisheries Regarding Coral Reef Restoration Techniques in 3 Negeri.	$ 7,985.07	$ -	$ -	$ 7,985.07
	Survey and selection of locations for coral transplantation	$ 5,100.75	$ -	$ -	$ 5,100.75
	Making Artificial Reef Concrete and Transplant Seeds	$ 52,548.45	$ 19,891.85	$ -	$ 72,440.30
	Monitoring, Maintenance and preservation of coral reefs	$ 11,700.51	$ 6,131.28	$ 15,377.16	$ 33,208.96
	About 90 young people (30 people from each Negeri) knows how to do transplantation, maintenance, care and monitoring of coral reefs				
	Training for youth groups on making articial reefs and cultivation/transplantation, maintenance and preservation of coral reefs	$ 7,414.18	$ -	$ -	$ 7,414.18
	Training on sustainable coral reef monitoring and organizational strengthening of the three youth groups to save coral reefs in the three Negeri	$ 7,973.88	$ -	$ -	$ 7,973.88
Total Component 2		**$ 92,722.84**	**$ 26,023.13**	**$ 15,377.16**	**$134,123.13**
Component 3 : Alternative economic development	**Aquaculture farming with the installation of 9 floating net cages for Cultivating Shallow Water Fish (3 cages for each never) which for every floating net cage, it is managed by a group (1 group = 20 households)**				

in coastal areas that are climate-resilient by utilizing technology in fisheries and Marine areas	*Conducting fish culture training for groups in every Negeri*	$ -	$ 13,485.07	$ -	$ 13,485.07
	Surveying location for floating net cage	$ -	$ 7,791.04	$ -	$ 7,791.04
	Design making of floating net cages construction and facilities provision for the fish culture	$ -	$107,138.06	$ -	$107,138.06
	Managing the floating net cages	$ -	$ 13,929.10	$ -	$ 13,929.10
	Nine floating rafts used to cultivate seaweeds (3 rafts for each never) which for every raft, it is managed by a group (1 group = 20 households)				
	Seaweed cultivation training	$ 13,485.07	$ -	$ -	$ 13,485.07
	Surveying *location for seaweed cultivation*	$ 5,462.69	$ -	$ -	$ 5,462.69
	Cultivating seaweeds	$ 7,241.42	$ 76,635.45	$ -	$ 83,876.87
	100 women in 3 Negeri have the skill required to process the result of fish culture and seaweed cultivation				
	Initial seaweed processing training	$ -	$ 23,055.97	$ -	$ 23,055.97
	Purchasing and advance training on supporting tools used in seaweed processing	$ -	$ 956.35	$ 27,532.46	$ 28,488.81
Total Component 3		**$ 26,189.18**	**$242,991.04**	**$ 27,532.46**	**$296,712.69**
Component 4 : The development of supporting facilities to anticipate coastal flooding and tidal wave	**The development of supporting facilities to anticipate coastal flooding and tidal wave**				
	Consultation and planning	$ 4,794.78	$ -	$ -	$ 4,794.78
	Surveying damaged areas around the embankment	$ -	$ 4,858.21	$ -	$ 4,858.21
	Embankmen restoration	$ 1,369.77	$118,730.60	$ 11,485.45	$131,585.82
Total Component 4		**$ 6,164.55**	**$123,588.81**	**$ 11,485.45**	**$141,238.81**

Total Components 1,2,3 &4				$803,619.40
Project Execution Cost				$ 84,357.84
MIE Management Fee				$ 75,478.07
Total Budget				**$963,455.31**

81. A detailed budget with budget notes is shown in Tables 13-16

Table 13. Komponen 1- Strengthening the adaptation of traditional fishermen in facing changes fish migration and circulation patterns due to climate change

	Year 1	Year 2	Year 3	Total
Consultants	$ 20,298.51	$ 14,208.96	$ 6,089.55	$ 40,597.01
Local Transportation	$ 13,027.61	$ 4,342.54	$ 4,342.54	$ 21,712.69
Vehicle	$ 4,197.76	$ 839.55	$ 559.70	$ 5,597.01
Workshop	$ 44,288.06	$ 12,653.73	$ 6,326.87	$ 63,268.66
Service, Supllies & Equipment	$ 47,617.16	$ 21,824.53	$ 9,920.24	$ 79,361.94
Infrastructures	$ 9,978.54	$ 11,028.92	$ -	$ 21,007.46
Total	$ 139,407.65	$ 64,898.23	$ 27,238.90	$ 231,544.78

Table 14. Komponen 2- Coastal ecosystems repair for the resilience of communities and alternate location for source fishing

	Year 1	Year 2	Year 3	Total
Consultants	$ 11,701.49	$ 11,701.49	$ 5,850.75	$ 29,253.73
Local Transportation	$ 4,155.22	$ 1,904.48	$ 865.67	$ 6,925.37
Vehicle	$ 2,425.37	$ 746.27	$ 559.70	$ 3,731.34
Workshop	$ 12,369.40	$ 4,123.13	$ 4,123.13	$ 20,615.67
Service, Supllies & Equipment	$ 22,541.49	$ 6,629.85	$ 3,977.91	$ 33,149.25
Training Courses	$ 3,731.34	$ -	$ -	$ 3,731.34
Infrastructures	$ 35,798.51	$ 917.91	$ -	$ 36,716.42
Total	$ 92,722.84	$ 26,023.13	$ 15,377.16	$ 134,123.13

Table 15. Komponen 3- Alternative economic development in coastal areas that are climate-resilient by utilizing technology in fisheries and Marine areas

	Year 1	Year 2	Year 3	Total
Consultants	$ 8,358.21	$ 29,253.73	$ 4,179.10	$ 41,791.04
Local Transportation	$ 2,176.12	$ 7,616.42	$ 1,088.06	$ 10,880.60
Vehicle	$ 671.64	$ 5,373.13	$ 671.64	$ 6,716.42
Workshop	$ 4,488.81	$ 13,466.42	$ 4,488.81	$ 22,444.03
Service, Supllies & Equipment	$ 9,166.79	$ 48,889.55	$ 3,055.60	$ 61,111.94
Training Courses	$ 1,327.61	$ 11,948.51	$ -	$ 13,276.12
Infrastructures	$ -	$ 126,443.28	$ 14,049.25	$ 140,492.54
Total	$ 26,189.18	$ 242,991.04	$ 27,532.46	$ 296,712.69

Table 16. Komponen 4- The development of supporting facilities to anticipate coastal flooding and tidal wave

	Year 1	Year 2	Year 3	Total
Consultants	$ 656.72	$ 11,164.18	$ 1,313.43	$ 13,134.33
Local Transportation	$ 3,080.60	$ 9,241.79	$ 3,080.60	$ 15,402.99
Workshop	$ 1,003.26	$ 6,019.59	$ 1,003.26	$ 8,026.12
Service, Suplies & Equipment	$ 1,423.97	$ 8,543.84	$ 1,423.97	$ 11,391.79
Infrastructures	$ -	$ 88,619.40	$ 4,664.18	$ 93,283.58
Total	$ 6,164.55	$ 123,588.81	$ 11,485.45	$ 141,238.81

82. The disbursement schedule is shown in Table 17.

Table 17. Disbursement schedule

Scheduled date	Year 1	Year 2	Year 3	Total
Project Funds	$ 264,484.22	$ 457,501.21	$ 81,633.97	$ 803,619.40
Execution costs	$ 29,525.24	$ 29,525.24	$ 25,307.35	$ 84,357.84
Implementing entity fee	$ 26,417.32	$ 26,417.32	$ 22,643.42	$ 75,478.07
Total	$ 320,426.78	$ 513,443.78	$ 129,584.74	$ 963,455.31

83. The budget for the execution costs (PIU/NIE) is indicated below.

Table 18. Execution Cost

Expenditure	Year 1	Year 2	Year 3	Total
Coordination and Management				
Director/Project Coordinator	$ 7,522.39	$ 7,522.39	$ 6,447.76	$ 21,492.54
Project Officer	$ 6,582.09	$ 6,582.09	$ 5,641.79	$ 18,805.97
Financial Manager	$ 5,641.79	$ 5,641.79	$ 4,835.82	$ 16,119.40
Financial staff	$ 3,291.04	$ 3,291.04	$ 2,820.90	$ 9,402.99
Sub-Total	$ 23,037.31	$ 23,037.31	$ 19,746.27	$ 65,820.90
Overheads and administration				
Administrative support (including : office equipment, materials and services	$ 3,761.19	$ 3,761.19	$ 3,223.88	$ 10,746.27
Fiduciary management				
Fiduciary management fee	$ 2,726.74	$ 2,726.74	$ 2,337.20	$ 7,790.67
Total	$ 29,525.24	$ 29,525.24	$ 25,307.35	$ 84,357.84

Table 19. Budget breakdown of the Implementing Entity Fee

Stage				

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

A. Record of endorsement on behalf of the government[24]

This program has been coordinated with the Government of Maluku Tengah Regency, the Government of Maluku Province, and the Government at Three Negeri

Name and Position	Time	Note
Samsul Maarib, S.Pi, MAP Head of the Fisheries Service Office of Maluku Tengah Regency	15 December 2018	Letter of support attached
Imaran Soumena, SP Secretary of Negeri Lima	10 Juni 2019	Letter of support attached
Saleh Tuharea Secretary of Negeri Ureng	10 Juni 2019	Letter of support attached
Ali Mahulette Secretary of Negeri Asilulu	10 Juni 2019	Letter of support attached
Djalaludin Salampessy , Acting Head of Regional Planning and Development Agency (BAPPEDA) Maluku Province	17 Desember 2019	Letter of support attached

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..

6. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

Inda Presanti Loekman
Executive Director a.i. of 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. Endorsement Letter from Mr. Djalaludin Salampessy , Acting Head of Regional Planning and Development Agency (BAPPEDA) Maluku Province

PEMERINTAH PROVINSI MALUKU
BADAN PERENCANAAN PEMBANGUNAN DAERAH
Jl. Raya Pattimura Nomor 1 Ambon
Telp. (0911) 352043, 354099. Fax. (0911) 355933
e-mail : bappeda_maluku@yahoo.com

Ambon, 17 Desember 2019

Nomor : 050.309 /BAPP-XII/2019
Lampiran : 1 (satu) lembar
Perihal : ***Surat Dukungan***

Kepada
Yth : **Direktur Yayasan Harmoni Alam Indonesia**
di
Bogor

Menindaklanjuti surat Direktur Eksekutif Yayasan Harmoni Alam Indonesia (HAI) nomor 11/HAI-Eks/XII/2019, tanggal 08 Desember 2019 perihal Permohonan Surat Dukungan dalam rangka pengembangan Program Adaptasi Perubahan Iklim Bidang Pesisir Laut dan Pulau-Pulau Kecil di Kabupaten Maluku Tengah Provinsi Maluku, maka bersama ini kami menyatakan memberi dukungan kepada Yayasan HAI untuk mengembangkan program dimaksud sesuai dengan perundang-undangan yang berlaku.

Mengingat pentingnya program tersebut dalam memperkuat kemampuan adaptasi perubahan iklim pada masyarakat di wilayah pesisir laut dan pulau-pulau kecil, maka HAI diharapkan untuk senantiasa berkoordinasi dan bersinergi dengan lembaga/Instansi terkait mulai dari tingkat Desa/Negeri, Kecamatan, Kabupaten sampai tingkat Provinsi. Dengan demikian, dukungan ini kami berikan dengan harapan agar program tersebut dapat terlaksana dengan baik serta dapat membawa dampak positif bagi kelestarian lingkungan.

Demikian Surat Dukungan ini dibuat, atas perhatian dan kerjasamanya diucapkan terima kasih.

Plt. Kepala Bappeda Provinsi Maluku

DR. Djalaludin Salampessy, S.Pi, M.Si
Pembina Tk.I
NIP. 19710212 199803 1 012

Annex 2. Endorsement Letter from Mr. Samsul Maarib, S.Pi, MAP, Head of the Fisheries Service Office of Maluku Tengah Regency

PEMERINTAH KABUPATEN MALUKU TENGAH
DINAS PERIKANAN
Jl. Buru Telp (0914) 21247 Fax (0914) 21247 – Masohi 97511

Masohi, 15 Desember 2018

Nomor : 523/990/2018
Lampiran : 1 (Satu) Lembar
Perihal : Surat Dukungan

Kepada
Yth. Direktur Yayasan Harmoni Alam Indonesia (HAI)
Di -
Bogor

Menindaklanjuti Surat Yayasan Harmoni Alam Indonesia (HAI) Nomor : 06/HAI-Eks/XII/2018 tanggal 10 Desember 2018 perihal Permohonan Surat Dukungan, maka bersama ini kami sampaikan beberapa hal sebagai berikut :

1. Kami selalu mendukung setiap program yang dilaksanakan dengan memperhatikan aspek kelestarian lingkungan yang berdampak positif terhadap kelestarian sumberdaya hayati.
2. Dalam pelaksanaan program dan kegiatan tersebut yang bertujuan untuk peningkatan Sumber Daya Manusia dalam mengelola lingkungan pada wilayah pesisir dan pulau-pulau kecil, senantiasa berkoordinasi dan bersinergi dengan lembaga/instansi terkait dari tingkat Desa/Negeri, Kecamatan, Kabupaten sampai tingkat Provinsi.
3. Program adaptasi perubahan iklim bidang pesisir, laut dan pulau-pulau kecil yang akan dilaksanakan perlu melibatkan masyarakat sekaligus melatih kemampuan sumber daya manusia terhadap aspek sosial, ekonomi dan pengelolaan lingkungan hidup.
4. Dengan memperhatikan dan melaksanakan poin 1 – 3, maka pada prinsipnya kami selalu mendukung setiap kegiatan pengelolaan wilayah pesisir dan pulau-pulau kecil yang ramah lingkungan.
5. Memperhatikan uraian tersebut diatas maka dimintakan kepada Saudara untuk dapat melaksanakannya sesuai aturan dan perundang-undangan yang berlaku.

Demikian dukungan ini disampaikan atas perhatian dan kerjasamanya diucapkan terima kasih.

Plt. KEPALA DINAS PERIKANAN
KABUPATEN MALUKU TENGAH,

SAMSUL MAARIB, S.Pi, MAP
NIP. 19680413 199803 1 006

Tembusan Kepada Yth.
1. Bupati Maluku Tengah di Masohi
2. Pertinggal

Annex 3. Endorsement Letter from Mr. Imaran Soumena, SP., Secretary of Negeri Lima

PEMERINTAH KABUPATEN MALUKU TENGAH
KECAMATAN LEIHITU
NEGERI NEGERI LIMA
Jln. Masjid Raya At-Taqwa Negeri Lima, KP. 97581

Negeri Lima, 10 Juni 2019

Nomor : 277/S.Duk/NL/VI/2019
Lampiran : -
Perihal : Surat Dukungan

Kepada Yth :
Direktur Yayasan Harmoni Alam Indonesia (HAI)
Di-
Bogor

Menindaklanjuti Surat Yayasan Harmoni Alam Indonesia (HAI) Nomor : 08/HAI-Eks/VI/2019 Tanggal 08 Juni 2019 perihal Permohonan Surat Dukungan, maka bersama ini kami sampaikan beberapa hal sebagai berikut :

1. Pada prinsifnya Pemerintah Negeri Negeri Lima senantiasa mendukung setiap kegiatan yang dilaksanakan oleh siapapun dan atau oleh lembaga manapun yang bersifat memberikan manfaat dan maslahat bagi masyarakat dan lingkungan.
2. Program Adaptasi Perubahan Iklim Bidang Pesisir Laut dan Paulau-Pulau Kecil yang akan dilaksanakan perlu melibatkan masyarakat sekaligus melatih kemampuan SDM terhadap aspek social, ekonomi dan pengelolaan lingkungan hidup, serta senantiasa memperhatikan nilai kearifan-kearifan local yang hidup ditengah masyarakat
3. Dengan memperhatikan dan melaksanakan poin 2 di atas, maka pada prinsifnya kami slalu mendukung dan menyokong penuh setiap kegiatan yang telah direncanakan dan akan dilaksanakan di Negeri Negeri Lima Kecamatan Leihitu Kabupaten Maluku Tengah.

Demikian dukungan ini sampaikan atas perhatian dan kerjasamnya kami ucapkan terimakasih.

a.n. Kepala Pemerintah Negeri
SEKRETARIS NEGERI

PEMERINTAH NEGERI NEGERI LIMA

IMARAN SOUMENA, SP

Annex 4. Endorsement Letter from Mr. Saleh Tuharea, Secretary of Negeri Ureng

PEMERINTAH KABUPATEN MALUKU TENGAH
KECAMATAN LEIHITU
NEGERI URENG
Jalan Air Putri KP. 97581

Ureng. 10 Juni 2019.

Nomor : 523/01/NU/VI/2019.
Lampiran : --------
Perihal : **Surat Dukungan**

Kepada Yth,
Direktur Yayasan Harmoni Alam Indonesia (HAI)
Di
Bogor .-

Menindaklanjuti Surat Yayasan Harmoni Alam Indonesia (HAI) Nomor : 10/HAI-Eks/VI/2019 tertanggal, 08 Juni 2019, Perihal Permohonan Surat Dukungan , maka bersama ini kami sampaikan beberapa hal sebagai berikut :

1. Kami Pemerintah Negeri Ureng selalu mendukung setiap program yang dilaksanakan dengan memperhatikan aspek kelestarian lingkungan yang berdampak langsung secara positif terhadap kelestarian sumberdaya hayati secara berkelanjutan.

2. Sedapat mungkin penyelenggaraan program dan kegiatan ini bertujuan untuk peningkatan sumberdaya manusia terutama dalam pengelolaan lingkungan di wilayah pesisir dan laut, dengan senantiasa berkoordinasi dan bersinergi dengan kami selaku Pemerintah Negeri Ureng.

3. Program Adaptasi dan Perubahan Iklim yang akan dilaksanakan ini sedapat mungkin melibatkan masyarakat Negeri Ureng, sekaligus penguatan kapasitas masyarakat Negeri Ureng meliputi apsek social, ekonomi dan pengelolaan lingkungan hidup.

Dengan mempertimbangkan ke-tiga hal tersebut di atas (point 1-3) , maka pada prinsipnya kami, *Pemerintah Negeri Ureng selalu memberi dukungan pada setiap implementasi program dan kegiatan pengelolaan wilayah pesisir dan laut*, yang dilaksanakan oleh **Yayasan Harmoni Alam Indonesia (YAI) di Bogor** kerjasama dengan **Institut Tifa Damai Maluku** berbasis issu Adaptasi Perubahan Iklim di **Negeri Ureng, Kecamatan Leihitu, Kabupaten Maluku Tengah.**

Demikian surat ini disampaikan sebagai dukungan implementasi program tersebut dan atas perhatian serta kerjasamanya diucapkan terima kasih.

a.n. Kepala Pemerintah Negeri Ureng

SALEH TUHAREA
Sekretaris Negeri

Annex 4. Endorsement Letter from Mr. Ali Mahulette, Secretary of Negeri Asilulu

PEMERINTAH KABUPATEN MALUKU TENGAH
KECAMATAN LEIHITU
NEGERI ASSILULU
Jln Raya Assilulu KP. 97581

Nomort : 660.1/11/NA/VI/2019.-
Lampiran : -
Perihal : Surat Dukungan

Kepada Yth,
Direktur Yayasan Harmoni Alam Indonesia (HAI)
Di
Bogor

Dengan hormat,

Menndak lanjuti Surat **Yayasan Harmoni Alam Indonesia (HAI)** Nomor 09/HAI-Eks/VI/2019 tanggal 08 Juni 2019tentang permohonan Dukungan maka bersama ini kami sampaikan bahwa :

1. Setelah membaca dan meneliti Surat tersebut kami mendukung sepenuhnya Program Adapatasi Perubahan Iklim Bidang Pesisir Laut dan Pulau pulau Kecil d Kabupaten Maluku Tengah yang direncanakan oleh Yayasan Harmoni Alam Indonesia untuk di laksanakan d Negeri Assilulu, Kecamatan Leihitu Kabupaten Maluku Tengah.
2. Kegiatan Adaptasi Perubahan Iklim Bidang Pesisir dan Pulau Pulau Kecil dalam pelaksanaannya dapat berkoordinasi dengan Pemerintah Negeri serta melibatkan masyarakat sehingga hasil dari program tersebut dapat benar – benar berhasil dan dirasakan manfaatnya oleh masyarakat.

Demikian surat dukungan ini disampaikan dan atas kerjasamanya kami capkan terima kasih.-

Assilulu 10 Juni 2019

a.n. Pj. Kepala Pemerintah Negeri Assilulu
Sekretaris Negeri

ALI MAHULETTE

Annex 5. Local Consultations List of Participants

Consultations between Desember 12nd and 13th, 2019

Asilulu villages community :

1. Ali Mabulawo (Head of Soa Tamaela)
2. Johan Laya (Head of Soa)
3. Asmawi Kibas (Saniri)
4. Ali Mahusette (Secretary of Negeri)
5. Yusuf Iksan Mahulauw, S.Pi. (Negeri Staff)
6. Wahyudi Abd. Ely (Negeri Staff)
7. Johan Layn (Fishermen)
8. Abutra Ely (Fisherman)
9. Hasan Madero (Fisherman)
10. Lila Kalauw (Women Group)
11. Ali Mamang (Fisherman)
12. Ismail Ely (Fisherman)
13. Muhammad Sayni
14. Majid Mahusette
15. Halima Layn (Women Group)
16. Sabila Mahulauw (Women Group)
17. Abuha Elu
18. M. Layn
19. Ismail Ely (Fisherman)
20. Hasan Madero (Nelayan)
21. Ali Mamang (Nelayan)

Ureng villagers community

22. Daena Laitupa (Women Group)
23. Isdayanti Kalauw (Women Group)
24. Umar (Fisherman)
25. Ake Hunath (Fisherman)
26. Djapar T. (Staff Negeri)
27. Abdula Heluth (Fisherman)
28. Muhammad Laetuysa (Negeri Staff)
29. Abdul Rahim Huath (Negeri Staff)
30. Sy Saimima
31. Abd. Latif Ely
32. Hasanudin Nayete
33. Hawa Laitupa (Women Group)
34. Halima Kotala (Women Group)

Lima villagers community

35. Midra Suneta (Head of Soa Henahelu)
36. Saripudin Soulisa (Fisherman)
37. Alwau Soumiwa N (Negeri Staff)

38. Ridwan Suneth
39. Ismail Mahulauw
40. Mohobar Soumena
41. Ridwan Tunny
42. Azis Mahulauw (Negeri Staff)
43. Sitti Nahda Maasily (Women Group)
44. Rapik Soulesa (Negeri Staff)
45. Mochtar Laturise (Kepala Dusun)
46. Padjri Soumena (Fisherman)
47. Imran Soumena (Secretary of Negeri)

Consultation between 4th – 7th January, 2020

Asilulu villages community :

1. Ali Mabulawo (Head of Soa Tamaela)
2. Ali Mahusette (Secretary of Negeri)
3. Yusuf Iksan Mahulauw, S.Pi. (Staff Negeri)
4. Halima Layn (Women Group)
5. Sabila Mahulauw (Women Group)
6. Hasan Madero (Fisherman))
7. M. Layn
8. Ismail Ely (Fisherman)

Ureng villagers community

9. Muhammad Laetuysa (Negeri Staff)
10. Isdayanti Kalauw (Women Group)
11. Djapar T. (Negeri Staff)
12. Abdula Heluth (Fisherman)
13. Hasanudin Nayete

Lima villagers community

14. Mochtar Laturise (Head of Dusun)
15. Padjri Soumena (Fisherman)
16. Imran Soumena (Secretary of Neger)
17. Midra Suneta (Head of Soa Henahelu)
18. Sitti Nahda Maasily (Women Group)
19. Rapik Soulesa (Negeri Staff)
20. Saripudin Soulisa (Fisherman)

21. DR. Gino V. Limmon, M.Sc. (Director of Maritime and Marine Science Center of Excellence, Pattimura University)
22. Abdul Haris (Acting Head of the Fisheries Service Office of Maluku Province)
23. Ilham (BAPPEDA Staff)
24. Dr. Djalaludin Salampessy, S.Pi., M.Si. (Acting Head of Regional Planning and Development Agency (BAPPEDA) Maluku Province)

25. Dr. Ir. Simon Tubalawony, M.Si. (Lecturer in the Faculty of Fisheries & Marine Sciences, Univ. Pattimura, Ambon / Oceanography Expert).
26. DR. Jacob Waas, S.Pi., M.Si. (Lecturer of the Faculty. Fisheries & Marine Sciences, Univ.Pattimura-Ambon Expert Oceanography, GIS, Participatory Mapping).
27. Rachmat Elly , S.Pi.