

ECO-CLIMATE VILLAGE

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Background

Indonesia is one of the Archipelago nations with 13.446 islands and about 81.000 shore lines. Based on the fact, coastal and marine areas can actually be a source of reliable income Indonesia. Generally, coastal was the junction between terrestrial ecosystems, sea, and air which came together in a fragile balance. Coastal consist of two areas, coastal aquatic as 12 miles far as and coastal terrestrial that managed by autonomous region as 12 miles far to the land.

From 33 provinces and more than 400 district of Indonesia lies on 5 'big land' (Andallas, java, Borneo, Sulawesi, and Papua) and others lies on an Islands. Judging from vulnerability to climate change and disasters, the coastal area is an area tha that greater risk than lareg land or inland.

A number 8 island pronices (Bali, NTB, NTT, Maluku, Maluku Utara, Riau, Bangka Belitung, Sulut) in Indonesia have the local unique system of ecosystems. Lands with community and availibility of food, water, energy is not balanced between the islands with each other. Because of that, there are growing up of the each other depending local wisdom. Biodiversities that they have, could be the alternatif for food resources, for more in the sea area. But it must be recognized in addition to limied (mainland) what is actually means having a high vulnerability, especially if associated with climate change and disasters.

Nusa Tenggara Barat (NTB) is one of the 8 island provinces in Indonesia. As the island province, NTB also has the high risk vulnerabelity for the climate change and environmental degradation, especially for the coastal area. Lombok Island (lie on NTB provinces), based on UNCLOS (United Nation Convention on the Law of the Sea) is the small islands because less than 10.000 km² at size.

Part of the coastal (beach) is intertwined with the oceans and in part shaped bay and cape is highly potential untapped food optimally, both as a source of food, econim, and energy. Some of them tapped as a tourism area, but have not any benefitfor the community yet. Ironically, majority of poor community live in coastal area, including this area of tourism. A limited land lanscape (has undergone degradation and deforestation) with ocean landscape affect the micro climate. Climate change has many causes of the significantly changes, with the weather that unreadable and unpredictable as usual.

KLU (North Lombok District)is the newest district, formed in 2008 which is the division of the island Lombok, NTB. As a new district (definitive in 2010), economic conditions are stil subsistence with the greatest poverty in NTB (43,17%). KLU Position such that a hidher

vulnerability to the impact of disasters and climate change, especially in the coastal areas for sure. However, compared with other district in Lombok and NTB in general, local wisdom in KLU still intact and exist, including face the climate change and disaster. Because of that, this district chosen as role model for developed as frame of comprehensive region development, island perspective and responsive to the climate change either to disaster, according to the agenda for changed that carried in the Small Island Conference in 2010 and SUKMA (Lesser Sundas) Community Congress in 2012.

Integrated and comprehensive coastal management be initiated to achieve a balance of sustainable development and climate change adaptation. Thus was born the concept of Eco-Climate Village (ECV) in Hamlet of Jambianom, Medana Village, KLU, that built gradually and participatory.

Jambianom's hamlet being chosen as the role model because of the strategic geographical and the very well organized community because they have an organization of the fisherman. Beside that, the poverty of social economic condition if it, became one of the consideration. Then, when viewed from the ecological conditions, no appropriate adaptation to anticipate the pressure of climate change and has not done terrestrial zoning and coastal aquatic. Another of the consideration, Jambianom is part of Medana Village administration area that strategic area of tourism based on North Lombok District Regulation No. 9 in 2011 on Spatial Plan of North Lombok District.

ECV concept is a Integrated and climate change adaptive coastal management drawn up on consideration of the legality, ecological, economic, sociological, and local wisdom. This concept is integrating between bottom-up concept, participatory mapping concept and long-term desire of coastal community with top-down concept, integrated coastal management as sustainable development program.

ECO-CLIMATE VILLAGE

This concept of coastal zone management is a bottom-up management that initiated villagers, later assisted by several agencies and then disseminated to local government. It integrates the response to the change agenda promoted in the archipelagos (island) conference initiated by Santiri Foundation along with several Non Government Organization and other supported by the Ford Foundation, Partnership, Samdhana Institute, and the regional government of NTB.

The conference carries three major themes of climate change (islands and small island), food sovereignty, water, and energy, as well as access to natural resources. All of it was attributed to the limitations and vulnerabilities of the islands natural resources, governance, and sustainable development.

The collective platform (civil society and government) islands, especially the Lesser Sunda-Maluku which have been formulated in the conference, is the renewal of natural resource governance and island perspective governance (sociologic-economic-ecologic) and

responsive to climate change through empowerment and synergy civil and local government SUKMA (Lesser Sunda-Maluku).

The renewal are intended to: (1) renewal of policy reform that ensures greater government support (in accordance with the character of the islands) and gave the greater authority and constructive to island residents and local government (institutional); (2) the expansion and guarantee people's access to natural resources and public services; (3) critical awareness islanders limitations and vulnerabilities related to natural resources and their basic rights; (4) increase the involvement of marginal or marginalized through more conclusively participatory 'space'

To support the realization of the purposes of this conference agreed to undertake the development of the various models of the arrangement of the landscape and local wisdom, perspective on the sustainability of natural resources, and accessible of the knowledge governance, continuously updated as a supporting system brings renewable agenda. Associated with the development of the models, the proposed by BPTPT-PU Denpasar (Traditional Housing Technology Development Center) to Eco-Techno Village in Karang-Bajo Village and Santiri Foundation is developing the concept of Eco-Climate Village (ECV) in the coastal village of Medana, precisely in Hamlet of Jambianom. The development of the concept of Eco-Climate Village is a model application of integrated coastal management, in anticipation of climate change, resilience increasing, as well as the improvement of social welfare with the carrying capacity of the coastal areas of need (economic, resource of biodiversity, natural resources, environmental life support viable coastal communities).

ECV is integrating all aspects of a holistic approach, consists of ecological approach, regulation, economic, and social. The development of ECV is a development program in units of coastal ecosystems in the islands as a role model of natural resource governance arrangement that has the carrying capacity and resilience in a sustainable manner, the spatial integration of the citizens a better life. This concept is a first articulated concept for conservation (overall, not just conservation of ecology, but includes the economic, legal, and social) areas affected by climate change. Implementation of the concept of planned residential areas Jambianom Hamlet of ± 5 acres and ± 10 acres for coastal aquatic management.

The model that developed in the concept into a direct part integrity ECV coastal micro (village) with the outcome of sustainable development, supported by the increasing capabilities of the institutional mechanisms of governance of natural resources and the people living in particular areas and the district in general. Broadly speaking, the methodological framework ECV concept refers to the basic principle (principle) common integrated coastal management of Marine and Fisheries Decree No. Kep. 10/MEN/2002, namely: (a) integration, (b) decentralized management, (c) sustainable development, (d) transparency and public participation, and (e) the rule of law

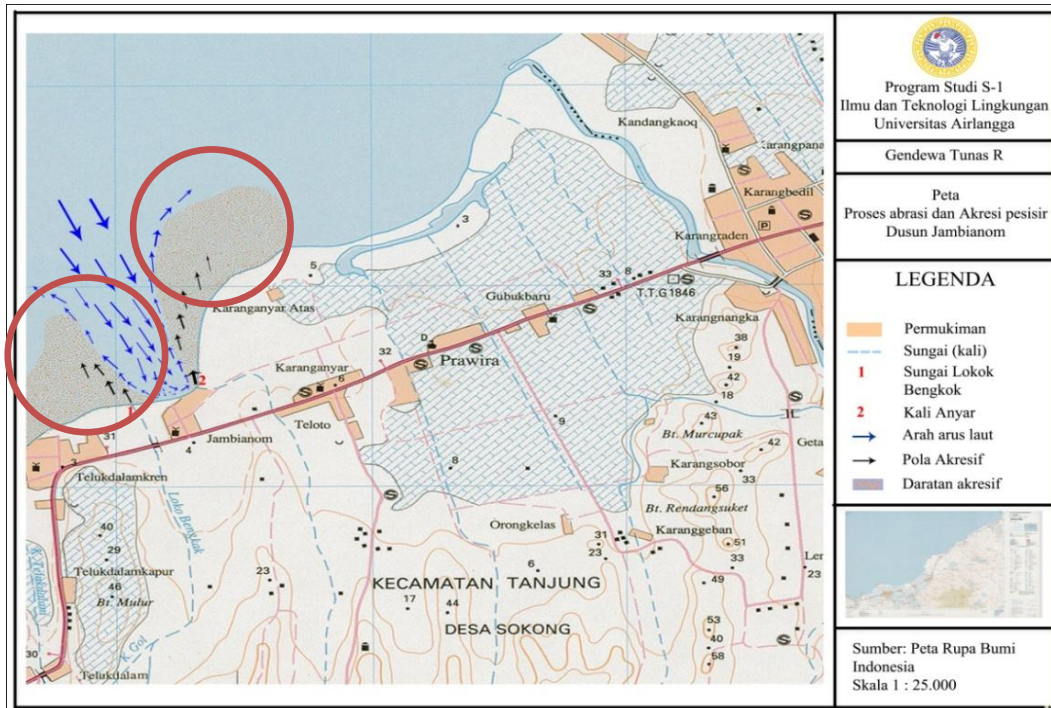
Climate change: Hamlet of Jambianom



Hamlet of Jambianom changing coastline, the last boundary waves reach land at normal wave conditions. The first change of the shoreline is accretive which is the opposite of the process of abrasion. Locations accretive occurred in coastal sediments receiving excessive intake then suffered abrasion.

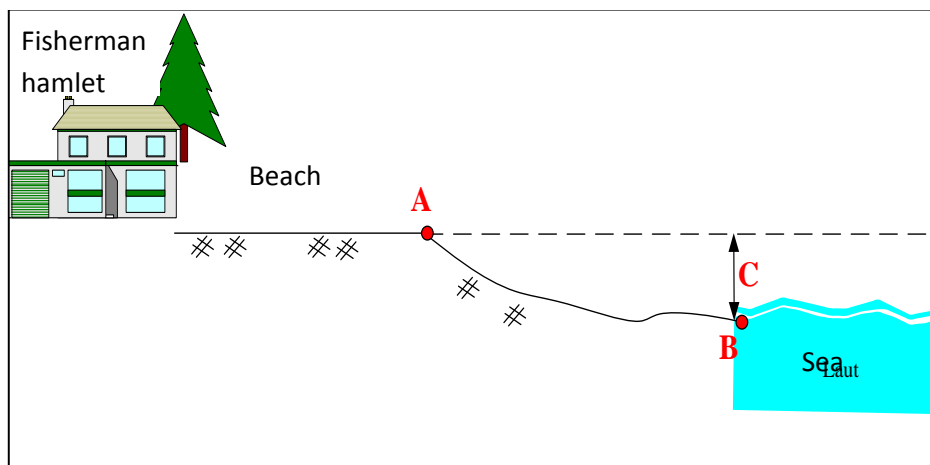
Erosion and accretion takes place alternately in accordance with changes in sea surface conditions, changes in energy erosion agent, the amount of sediment available, and the slope of the bottom waters. Accretion beach by fine sediments often followed by the growth of mangrove roots serve as a reinforcement of new sediment from erosion or landslides. Accretion speed is controlled by some intense beach erosion sedimentation upstream.

Jambianom hamlet sandwiched between two river mouths, the River and the Crooked River Lokok Anyar. Flow of both rivers to form the walls erode sediment carried by the flow to the river mouth. Sediment is beginning to jut into the ocean reaches ± 30 meters that occurred during the last 25 years in the hamlet Jambianom.



Shoreline change the second is that the coastline jutting into the land due to abrasion. Shoreline shift has occurred gradually over the past few decades. After the incident, Hamlet shoreline inland Jambianom changed up to ± 3 meters permanently

The increase in sea surface heat causes a change in the direction of the mainland coastline permanently. The figure below will shows sketches and line spacing and the beach. Based on the measurements, the height of the shoreline to shoreline around 2-3 meters and the distance to shore shoreline 9-15 meters. The condition of sea level rise occurs secara linear, then for 20 years to come certainly can be a major threat because of the current villagers high average shoreline shoreline between 1-2 meters. As a result, sea level rise of 2 meters would inundate settlements to a radius of 500 meters (Kukuh et al., 2011).



- A: Shore Lip
- B: Shore Line
- C: Height within Band A

Location	A-B Average	C Average	Closest residential far from shore lip
Jambianom Hamlet coastal area	10 m	1,8 m	12 m

The table shows that the height of shore lip is high vulnerability for tide. Sea level increase not threated shore line changing only that impact for land use. It might impact for high level of abrasion range caused of the erosion of the solid layer of sand on the beach will strengthen the pace of sea water intrusion into groundwater. Intrusion might affect to groundwater quality of Jambianom's hamlet.

Based on researched in Hamlet of Jambianom beach, there are generally change of tide and low tide, especially for the tide. Otherwise for the low tide, relatively normal, it means low tode have comparable condition with sea level increase pattern. The highest normal tide to the shore lips based on research for 14 day was $\pm 1,5$ m from shore lines. The alteration of tide an low tide was changed fisherman schedule which impact for economical communities in hamlet Jambianom (most livelyhood of Jambianom's hamlet community was fisherman). Eventhough, it caused the fisherman could not go to the sea, then gave them more impact because of the income decrease.

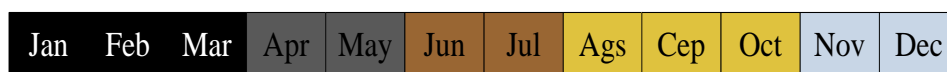
Beside the alternation tide and low tide, Kukuh's Research (2011) shows the alternatioin facet anomaly in some coastal point of Lombok's coastal. The data is backed up by the results of discussion and interviews with vilagers Jambiano, in the behavior of ocean waves compared to 10 years ago. There are 3 important things related to facet alternation.

a. The alternation of months facet

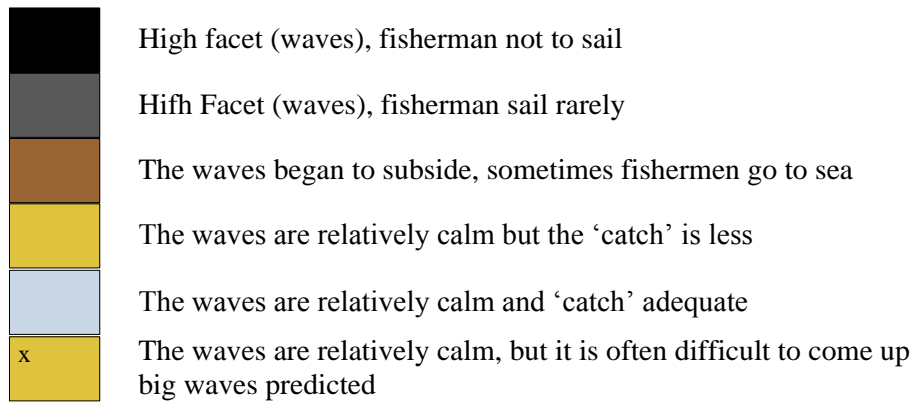
Within one year a facet cycle wherever there is well understodd by the fisherman vommunity. In general there are two categories, namelyin the high facet and month with calm winds. Low face height is associated with a change in wind flow from the west and east. Wind flow from the west generall causing effects of high facet and wind flow east to make room for more comfortable fishing at sea.

Cycle change the high and low waves in general during the period of one year does not look so obvious, but actually the more change is coming wave intensity in all seasons

b. The alternation of facet monthly



Graphic: yearly alternation of facet (Kukuh et al., 2011)



The change is quite striking is the coming wave of every month. If in 10 years ago fishermen not to sail in January to March because of the high-level waves, so this time the fishermen often go to sea in the months that should not wave season. In the month from June to October, normally calm winds and waves subside, but the fact of each month in the period is always big waves that can not be expected that there is a reduction in days at sea for fishermen. At first fishermen to go to sea as much as 15-20 days, but now it can be reduced.

When normal sail in a month (when the waves calm) usually starts from the date of 25-10 (on calendar) because on 11-24 reduced the number of fish in the sea due to exposure to the moonlight was so bright that makes the fish are not on a fishing spot as usual, and would rather be in a better spot in minimal light exposure so that there is effective \pm 16 days at sea. However, it is still within the 16 days should be reduced by the presence of anomalous wave can not be expected to come

Some changes also occurred against the village, such as a change in behavior at sea. Once at sea fishing boat engines typically spend an average of 6-12 hours, departing at 17.00 and return between 24.00 am to 06.00 pm. While using the sailboat and canoe paddles, generally depending on the size of the waves. For fishermen who do not have a boat, fishing work done during the day at the seaside

Typology	Owned gear	Radius catchment (km)	Intensity of fishing (days per months)*
Subsistence fisherman	Scatter nets, hook	0 – 0,25	20 – 25
'small' fisherman	Hook, scatter nets, sailboat (length 2-3 meters) , and hugh rather scatter nets	0,1 – 2	15 – 20
'Average' fisherman	Sailboat and machine (length3-4 m) 5-6 PK	0,1 – 2	15 – 20
'big' fisherman	boat (length 5-7 m), cob webs	1 – 20	20 – 25

*normal condition at sea

The existence of the number of days at sea fishing and the opportunity to get the smaller fish that have changed the behavior of fishermen in terms of income. The alternative is to find a job outside of fishing opportunities. There is a farm worker, labor carpentry, a merchant, and raise cattle, not even only rarely idle. The low carrying capacity of the economy to be the option to seek other sources of employment are very limited.

Hamlet Jambianom economy there are facilities that support the economy of Hamlet Jambianom include stalls, kiosks, point of sale and purchase of fish, and others. Meanwhile, to meet daily needs such as side dishes or food needs, citizens must lead the market with the distance from the hamlet Jambianom \pm 8 km to the Market of Tanjung or buying groceries from itinerant traders. Meanwhile, to meet the economy, most people rely on marine resources and some other activities as a builder.

In general, is alleged to have occurred a significant change in the quality and quantity of catches that have occurred since the last 3-5 years. Nowadays, it is rare to get fishermen catch fish with a weight of more than half a kilogram per tail. Even some types of fish that used to appear in certain months, is now no longer found.

Several factors of reduction are thought to cause climate change and decision sea coral for building materials (lime). Climate change is due to the uncertainty meant the weather and the waves were very influential on the behavior of fish in the sea. Another factor, taking coral reef limestone by the Gulf of Hamlet Dalem Kren contribute to the reduction of fish, as many coral reef habitat, feeding and nursery ground fish have been damaged.

Hamlet of Jambianom: Eco-Climate Village

As has been known that the ECV is bottom-up concept, which means that the ECV is a 'dream' knitted by the Dusun Jambianom as adaptation to climate change, food security, energy independence, water sufficiency, and sustainable livelihoods.

For the creation of a 'dream', the community of Hamlet Jambianom perform mapping hometown dreams for the future. Taken together, the people sit together and knit a dream they desire.



To manage land area, dream map created by society with more female domination. This is because the daily work area is the area of terrestrial women jambianom hamlet. While aquatic and marine management areas created by masayrakat with male dominance more. For the same reason, because their husbands or men spent more time at sea.

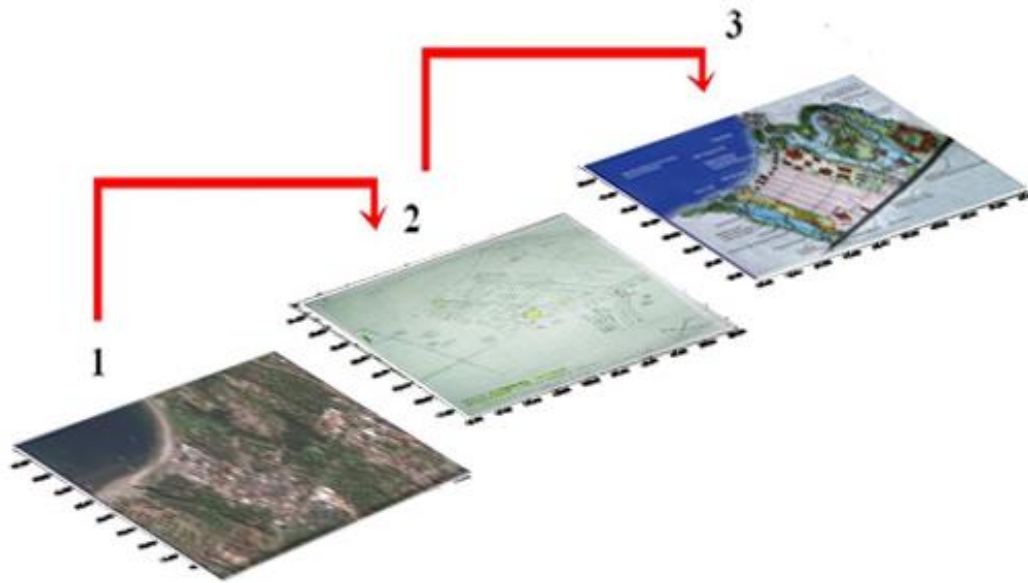


Map Hamlet community dream Jambianom terrestrial areas



Map Hamlet community dream Jambianom marine management area

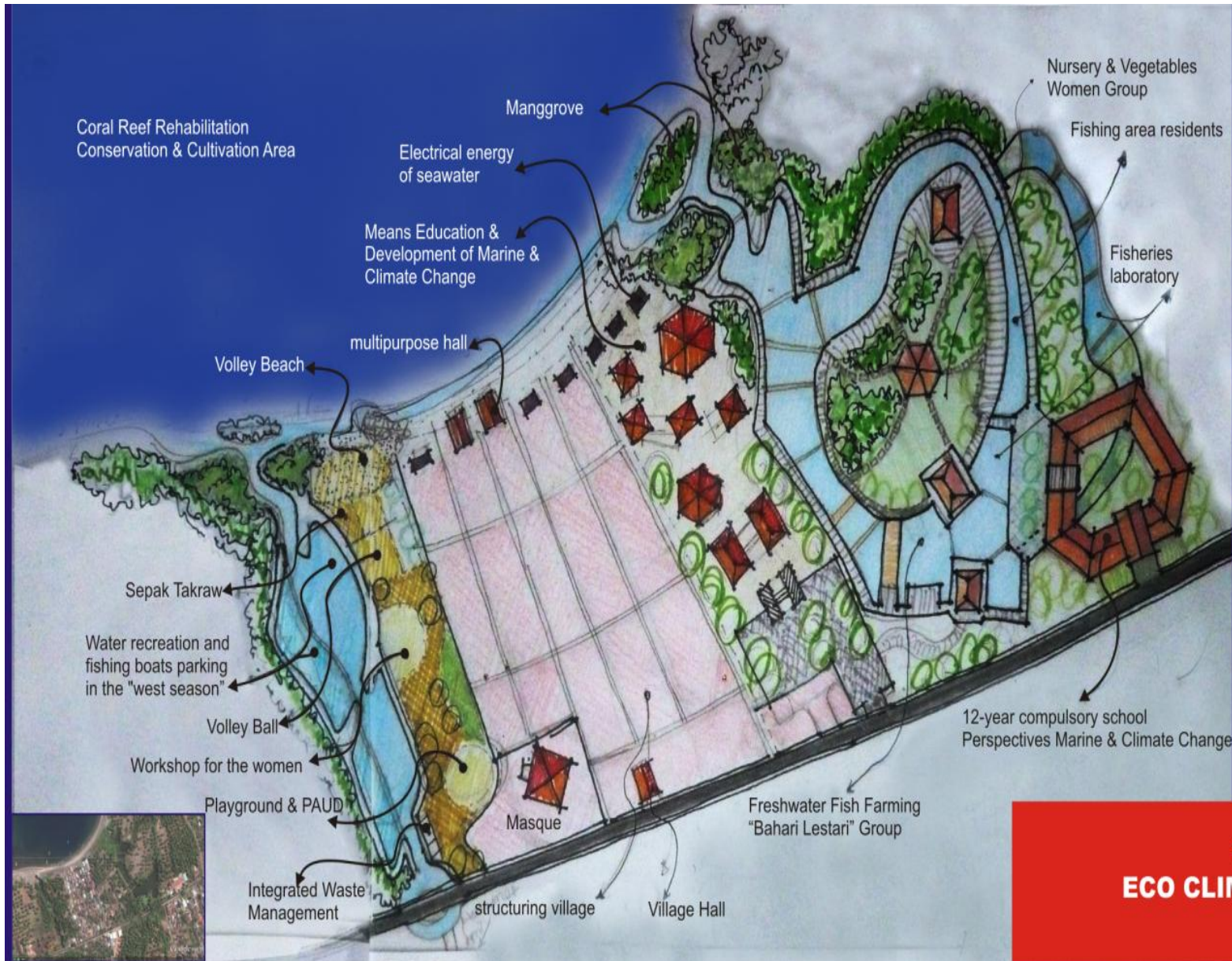
After this dream, and then woven united in a wishful dream together. It's time to perfect community dream Hamlet Jambianom as adaptation to climate change and independent Hamlet (self-organizing capability). For that, Santiri Foundation and several team of experts help you enhance your dreams by pursuing the development masterplan.





DENAH KAMPUNG NELAYAN
JAMBIANOM MADANA LOMBOK UTARA

SKALA = 1 : 100. KORDINAT -8.21'49.66" S. 116.08'07.53" E.



sub Village Jambianom
 Medana Village -
 sub-district Tanjung
 North Lombok
 West Nusa Tenggara
 INDONESIA

**SKETCH PLAN
 ECO CLIMATE VILLAGE**
 Ir.T. Kukuh S.

Scaling up: ECV and PDPT Integration

Based on vulnerability to climate change and disasters, the coastal area is an area that has a greater risk than large land or inland. Therefore, considering this, the Ministry of Marine Fisheries (KKP) initiated and developed the Resilient Coastal Village Development Programme (PDPT). This program aims to reform and improve the lives of the coastal village / fishing-based communities and facilitating the role and functioning of communities as agents of marine and fisheries development

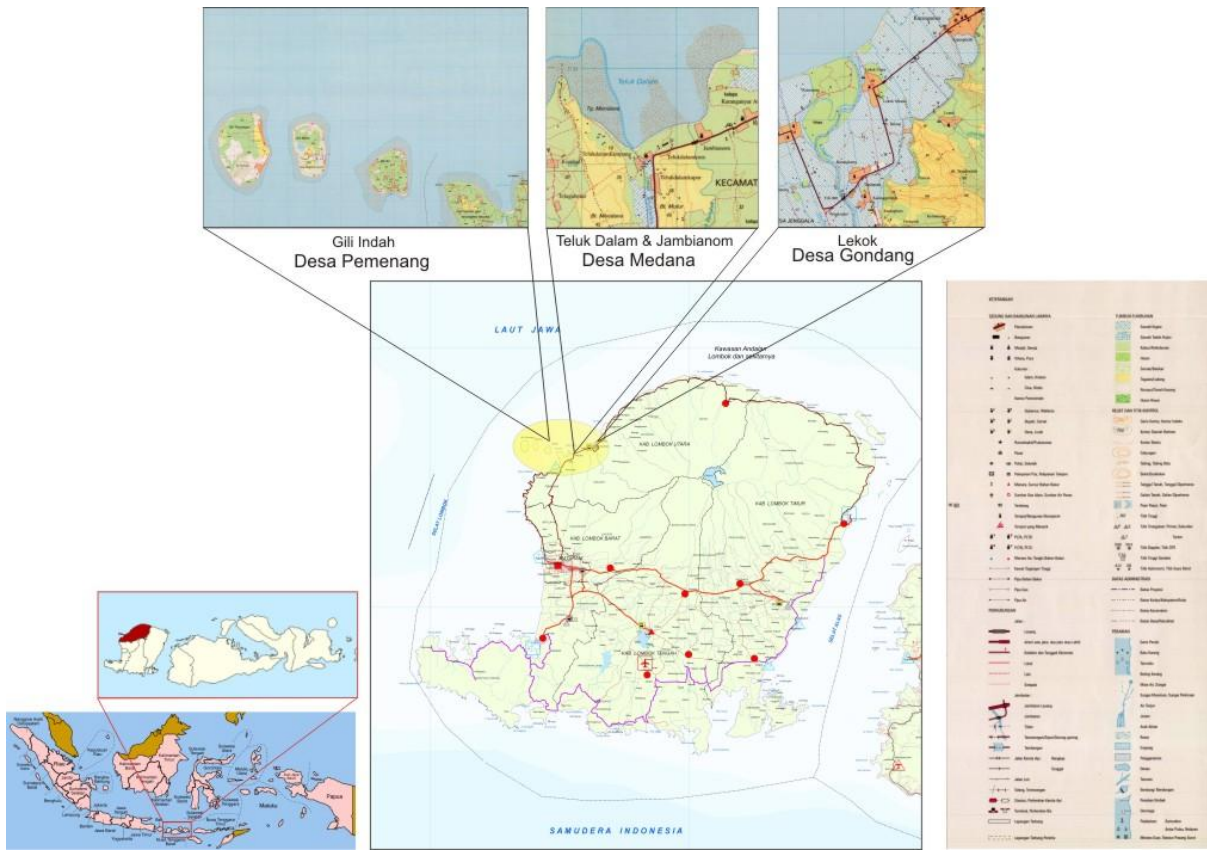
PDPT development model consists of three parts, namely: (1) the coastal village development plans, (2) strengthening institutional capacity, (3) the achievement of a goal PDPT activities. Thus, the goal of the PDPT model is the alleviation of poverty, sustainable community institutions, environmental sustainability, financial independence and village disaster preparedness and climate change.

The thing to remember is that if not done carefully, it is possible that the same thing will happen with the other great ideas, which is a monument to the name without the real work effectively and utilized in a sustainable manner.

Previously, the concept of ECV gained positive responses from various parties, thus worth to continue the implementation and dissemination. This concept is also very possible to be integrated in the PDPT or a broader scale, even a combination of several villages can be part (entry point) for the development of municipal area.

Recently, the development of integration between ECV and PDPT are running in the North Lombok District, number 3 villages (Desa Medana, Lekok village, and the village of Gili Indah), And in North Maluku (village-Galo Galo Major and Village Koloray).

Furthermore, ECV is planned to be implemented in the form of realization SUKMA as citizens SUKMA reform agenda and one of the methods of adaptation to climate change in coastal areas, islands, especially small islands.



Locus for ECV in North Lombok District

Bibliography

Kukuh, T., Ichsan, C. A., Jasmawadi, A. L., Sudarsono, D., Markum. 2011. Merajut Mimpi Kelola SUKMA, Kajian Tata Ruang Berperspektif Perubahan Iklim. TALASUKMA: Lombok