IMPLEMENTATION OF COMMUNITY BASED DISASTER RISK REDUCTION IN COASTAL AREA OF PEMALANG
(CASE STUDY: MANGROVE-COMMUNITY IN LAWANGREJO VILLAGE)

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ABSTRACT

The coastal as dynamic area has very huge potential resources of physical and biodiversity. Moreover, it is estimated that more than two thirds of the cities world populations are located in coastal area with high density and high growth of population. According to that, coastal has lead to high pressure area both physical and social pressure and cause vulnerability to disaster, including storm and tidal flood. Institutional contribution inventory produce significant information regarding the community capacity in disaster risk reduction. Mangrove planting as result of participative action within government and NGO has potential benefit to be developed in local planning instrument. Operational management assistance and rehabilitation of mangrove ecosystems is implemented by community as self initiated action of disaster risk reduction.

Keywords: Mangrove Community, Coastal Flood, Disaster Risk Reduction

I. BACKGROUND

Indonesia has more over than 13,000 islands and two-third of ocean. The national government has concerned and prioritizes this issues by established new department named Ministry of Marine and Fisheries Affairs in 1999. This new legal ministry directly controls and gives the local government authority to manage their ocean and coastal resources, and emphasize profits together ith ecological and coastal environment sustainability which must not be neglected. Along with this, in 2002 this ministry also adopted the ICZM and develop integrated management for coastal resources. To sustain ICZM programs, in 2002, the wide-ranging regulations of ICZM were announced under the Ministry of Marine Affairs and Fisheries decree no.10 of 2002 entitled "The guidelines for integrated coastal planning" and has been renewed in decree no. 16 of 2008 entitled "The planning and management of coastal area and small islands" (Farhan and Lim, 2010). Decentralization in managing coastal resources may provide the new paradigm to gives more chances for every province to responsible with their coastal area. However, in Indonesia, much of marine ecosystem information inaccessible by local government and reduces the awareness of ICZM program. Related with that, the legislation linking to coastal protection has never been so necessary to study and comprehensively reviewed of the beach protection in Indonesia. In the other hands, community as part of coastal ecosystem has faced the hazardous conditions related with quality degradation through natural and also man-made hazard i.e. industrial contamination, waste disposal, in-appropriate land use etc. Overexploitation and degradation of coastal resources and changes in land use and land cover in the hinterland have

altered and will continue to alter coastal ecosystems of the tropics (Jennerjahn et al. 2008).

The vulnerability of coastal communities and economic sectors to coastal flood is expected to increase in the coming decades to century due to both environmental and socioeconomic changes (IPCC 2007; Ward et al. 2010). Coastal communities have developed the understanding about the disaster's condition. Local knowledge based on traditional method to understand climate change has been practically guided local people to cope with coastal inundation, although they still suffer with the loss. It is common to have a physical scientist or engineer to determine the probability of occurrence of the natural hazard, whereas social scientist usually best trained to deal with vulnerability and exposure (Nott 2006). In order to reduce the disaster risks, mangrove forest has naturally grown and creates the protecting system related with coastal ecosystem.

Mangrove ecosystem as part of the coastal ecosystem has significant role in the coastal area. Mangroves supply wood products to support house construction, firewood and other non-wood forest manufactures including cosmetic, and medications. Mangroves are defined as woody trees and shrubs which flourish in mangrove habitats or mangals. (Hogart P, 1999) At the ecosystem level, mangroves serve as habitat and breeding areas for many commercially important fish and crustaceans, provide detritus for offshore fisheries, controls coastal erosion as well as maintaining water quality (Robertson et al. 1992; Kairo et al. 2002).

Java as highest populated island in Indonesia also extensively face land use change together with the people's need on land for agriculture, industries, settlements and tourisms. Mangrove forest can be functionally changed for fisheries area to obtain the fish product in several places. One of the remain mangrove forest in Java is located in Pemalang regency, Central Java. The critical area of mangrove forests in Pemalang was 721.25 ha of the total 4427.98 ha potential area. Extensive mangrove forests are heavily damaged area of 3,715.24 ha and covered 712.74 ha (Forestry and Agriculture Department of Pemalang, 2006). This condition is caused by the conversion of mangroves for aquaculture or for human habitation. Joint cooperation of government with communities and NGOs was trying to rehabilitate mangrove areas until the end of 2005 has been successfully rehabilitated more than 465 ha mangrove area. As reported also by Wetland International in Sahlan et al. (2010) that 10 - 20 years ago, the condition coast beaches still green and changed dramatically to barren even though there was already reforestation efforts. Mangrove vegetation in Pemalang is distributed surrounding Ulujami district, which consists of various types, of which the most prevalent type is *Rhizophora* and *Avicennia sp*. Most of land which is located close to dikes, fish pond and river mouth are potentially overgrown for mangroves habitat.

Furthermore, initiative process of community guided by both academic and government in identifying the problem has been made as results internal discussion among community member. Indigenous spatial data category has been produced during the intensive affirmative meeting, and contributes several alternative solution including mangrove plantation, and eco-community creation. How the community works should be noticed as participative model which may be elaborated by another elements in conservancy.

II. METHODOLOGY

This paper performs community capacity in coastal area due to coastal flood and their activity. Mangrove planting is developed by the community in the guidance of local government and NGO. Primary data is conducted by survey and observation process, including the use of GPS, and simple participative mapping (P-

GIS). The benefits of local information gathered using in-depth interview also in FGD forum, which is cooperated by the private consultant, community, local government and NGO. Several data produces including thematic map and photos, with the support of secondary data from statistic office (BPS) and village government office while, the consultative information is functioned in supporting data analysis.

Participatory rural appraisal

Participatory Rural Appraisal (PRA) is considered to be used in Lawangrejo community to obtain the simple approach to investigate the actual situation. This approach was developed in early 1990s with considerable shift in paradigm from top-down to bottom-up approach, and from blueprint to the learning process (Cavestro, 2003). In fact, it is a shift from extractive survey questionnaires to experience sharing by local people. This method is where communities effectively manage their mangrove forest as part their natural resources. Several principles. Several activities in PRA which used in Lawangrejo are: Mapping, Venn diagram, and Focused Group Discussion (FGD). These activities are responded the need of community to identify the problem related with the coastal flood occurrence, and how to manage the mangrove forest as part of solution.

Participatory Disaster Risk Assessment (PDRA) is the fourth step in Community Based Disaster Risk Management (Abarquez and Murshed 2004). PDRA is both a dialogue and a negotiated process involving those at risk, authorities and other stakeholders. It is a process whereby all parties concerned collect and analyze disaster risks information, in order to make appropriate plans and implement concrete actions to reduce and/or eliminate disaster risks that will adversely affect their lives. Several steps that constructed during this process are described as follows.

Step 1 - identifies hazards in the community. Its output should identify, list down and describe the nature of hazards in terms of its recurrence, seasonality, location, possibility of early warning and general knowledge of the people about the hazard.

Step 2 - captures the hazards, vulnerability and natural resources and facilities of the community in community and/or digitized maps.

Step 3 - identifies and assesses the vulnerabilities and capacities of the community in general but makes sure that there is gender disaggregation of data; special needs groups like the children and disabled are given utmost considerations as well.

Descriptive analysis is taken to explain data and information and GIS is beneficially used as tools to map the community explanation together with pictures and secondary data documentations. Qualitative information through interview and the FGD process are construed and analyzed as part of participatory appraisal.

III. GEOGRAPHICAL SETTING

Pemalang (Figure 1) is one district that is located on the northern coast of Central Java province. Astronomically Pemalang is located between 109^{o} 17 '30 "- 109^{o} 40' 30" east longitude and 7^{o}20' 11" - 8^{o} 52 '30 "- south latitude. Pemalang is located in the north part Central Java has potential variety of sectors in order to speed up welfare society. Pemalang approximately has 34.6 km beach that stretches from the eastern part Tasikrejo village, Ulujami district to the west part of Lawangrejo village, Pemalang district. In the location, there are many areas of

aquaculture and coastal mangrove forests and crops for tackling abrasion protection.

Geologically, coastal part of Pemalang defined from alluvial plain which dominantly whereas covers the northern part of the regencies and also combine with fluvial plain within low steep and potential for flood occurrence. Various types of soils in this area consist of grey hydromorph with clay texture and mixed with sandy soil as result of sediment process of the river.

Land Use and Topography

Administratively, coastal villages in Pemalang regency divide into 4 districts; Pemalang district, Taman district, Ulujami district, and Petarukan district. They cover entirely 80, 44 km². Coastline of Pemalang divided into 16 coastal villages with its specific land characteristics. Pemalang are dominantly consist of dry land (approximately 72,836 ha), and wet land (approximately 38,694 ha). Rice fields covering 38,694 ha, followed by forest (29,972 ha), dry field / plantation (17,951 ha) and construction (14,875 ha) (BPS 2009). Topography of Pemalang coastal region consists of flat topography, with the average of 1.91 meters above sea level. Morphology plains sloping east ward with an average slope of 2.38%. Starting from coast to Southern part has undulating to hill topography.

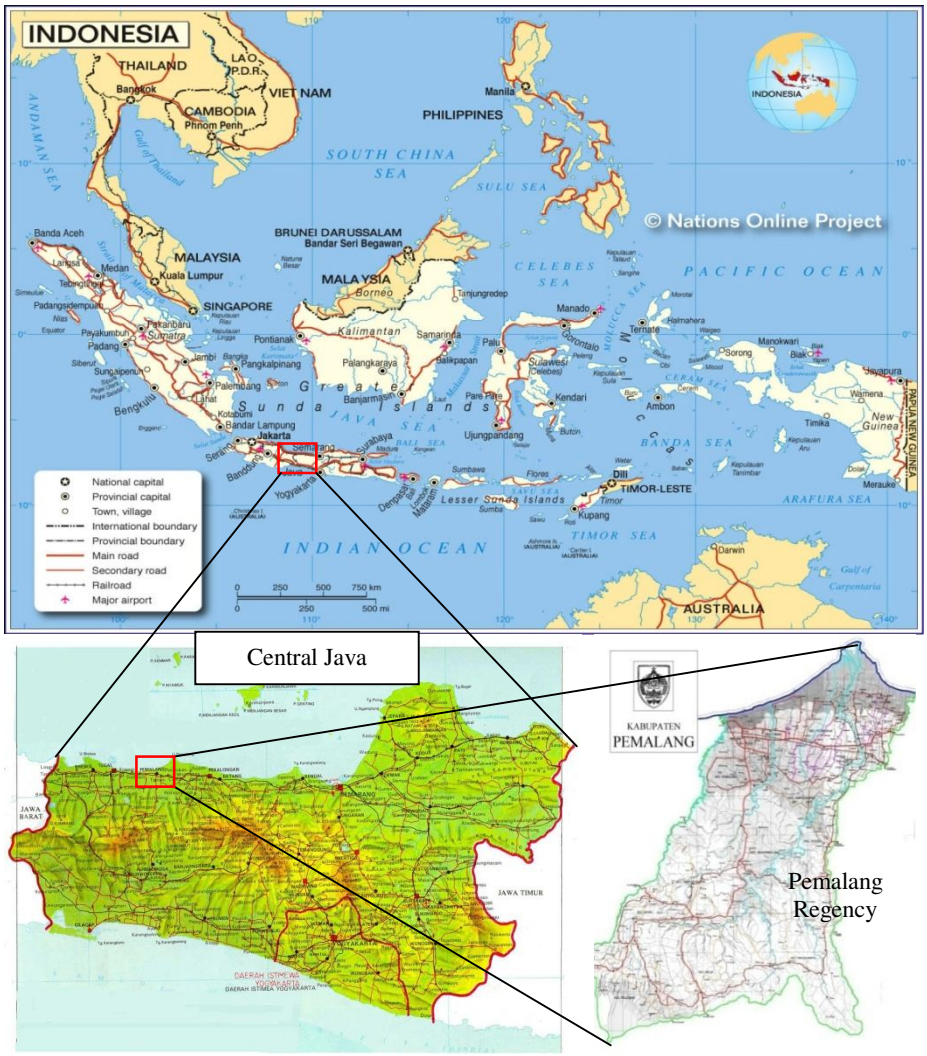

Figure 1. Research site position

Climate Condition

In general, area of coastal villages of Pemalang is categorized as tropical climate with maximum temperatures reaching 31.56 ° C. There is a temperature rising tendency from 2000 to 2009. Based on Meteorology, Climatology, and Geophysics Department (BMKG) information, in 2000-2002, temperature rise 0.3 ° C and slowly decreased in 2004 then rose again in 2005. After that a decline back in 2006 and rose back in 2007 a little further down and climb up to the year 2009 (Figure 2).

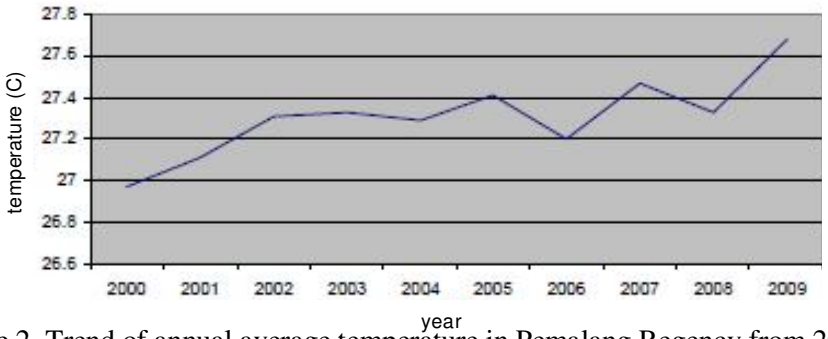

Figure 2. Trend of annual average temperature in Pemalang Regency from 2000-2009

Oceanographic Condition

Tides that occurred in Pemalang have mixed pattern tilted single day. Amplitude of tides in coastal waters belong to relatively large and ranged between 90-110 cm. Lowest tidal (LWL) range between 3-40 cm and the highest between 140-160 cm. Direction and speed of currents in coastal waters is influenced by Pemalang current pattern in the Java Sea are highly variable and influenced by the season. In West season (December-February) the current moves faster than west to the east with speeds ranging from 38 to 51 cm/sec. In East season (June-August) sea currents moving between 12-45 cm/sec from the East to the West.

Coastal Flood Condition

Regarding to the previous research of Sahlan *et al.* (2010) based on the information the respondents, in 1988 there has been a great flood occurred due collapse and flood water and rivers with an average height of 1.26 meters. This flood covers almost of houses, farms and small roads and destroyed most of infrastructures in several villages. The flood duration recedes to 19 hours. Coastal flood occurred on average four times a year i.e. in May, June, July, and August with an average height of 0.97 m. Coastal flood has damaged the house the area aquaculture. Coastal flood occurs in the absence of mangrove forest since forest conversion for farming purpose (Sahlan et al. 2010).

Mangrove distribution in Lawangrejo village

Mangrove vegetation in the coastal of Lawangrejo covering about 2 ha, of which 1.3 ha are located at 109^0 21 '12.9" - 109^0 21' 28.4" E and 6^0 51 '55" S - 6^0 51 '58.6" S and the rest are found spread around the mouth of the River Plawangan (Figure 3). Coastal area of Lawangrejo village consists of several zones with its own characteristics. Mangrove area in the Village Lawangrejo is uniform as result of rehabilitation program of government.

IV. RESULTS AND DISCUSSION

Mangrove Condition Inventory in Coastal Area of Lawangrejo Village

The mangroves are sources of highly valued commercial products and fishery resources and also as sites for developing a burgeoning eco-tourism (Kathiresan and Bingham, 2001). The mangrove forests have been shown to sustain more than 70 direct human activities, ranging from fuel-wood collection to fisheries (Lucy,

2006). Significant mutual role actively shows equal position of mangrove ecosystems and the productivity of fish and marine life in coastal area. Because of this and its location in a geologically very active zone particularly its coastal ecosystems are extremely vulnerable to any kind of environmental change (Lavigne and Gunnell 2006). Mangrove dominantly lives in mud soil material. Mudflats (intertidal mud flats) in the outer mangrove and directly overlooks marine habitats of various communities nekton and the numbers are very overflow (Gunarto 2004). This may indicate that this area is rich feed source as a result of primary production and high and the presence of secondary import organic material from the sea and mangrove.

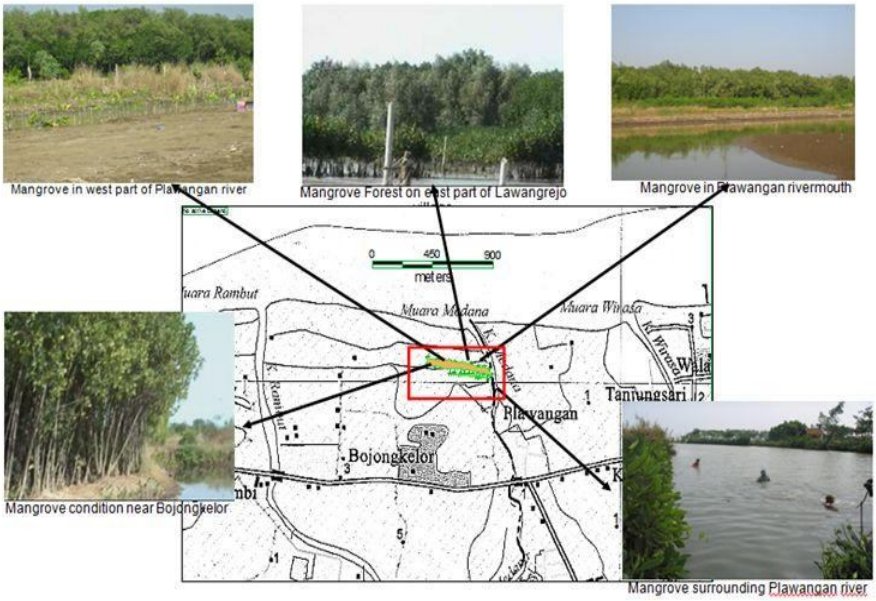

Figure 3. Mangrove condition inventory in Lawangrejo village

Mangroves ecosystem in Lawangrejo Several species are found in the area and categorized into several species. *Rhizopora mucronata* (Rm), *Avicennia alba* (Aa), *Avicennia marina* (Am), *E. agallocha* (Ea) and *Hibiscus tiliaceus* (Hi). According to Kitamura (1997) species *Rhizopora mucronata*, *Avicennia alba* and *Avicennia marina* including major true mangrove species[*1], *Excoecaria agallocha* including minor true mangrove species[*2] and *Hibiscus tiliaceus* including mangrove association type[*3]. Mangrove species classification is described in the Table 1.

Table 1. Mangrove composition in coastal area of Lawangrejo Village, Pemalang Regency

Famili	Species	Mangrove component
Avicenniaceae	*Avicennia marina* (api-api)	Major
	Avicennia alba (api-api)	Major
Rhizophoraceae	*Rhizophora mucronata* (bangka)	Major
Euphorbiaceae	*Excoecaria agallocha* (madengan)	Minor
Malvaceae	*Hibiscus tiliaceus* (waru)	Associative mangrove

Source : Field work result of Forestry and Agriculture Department (2006) and classified using Kitamura (1997)

*1) Major group shows vegetation morphology including, as the aerial root system, and the specific physiological mechanisms to excrete salt in order to adjust to the mangrove environment.

*2) Minor group (coastal vegetation) is the vegetation that is not included in the striking community of plants - plants that are around their habitat and rarely creates pure stands.

*3) Associative mangroves are a group of rare vegetation that grows in the actual mangrove communities and are often found in land plants.

Community mangrove forest which called *Hutan Bakau Rakyat* (HBR) was established near Krasak River with total area of 10 ha, with the dominance of *Rhizophora sp* and *Avicennia sp*. The mangrove existence has destructed in 1995 by floods and caterpillars and leaved 15% of existing plants. Currently, the total area of mangroves were located approximately 2 ha in 1998-2000 due to looting by many people. However, around the mouth of the Krasak River has widely planted by *Rhizophora sp* and *Avicennia sp* of about 0.2 ha. *Rhizophora mucronata* dominantly spread in mangrove forest Lawangrejo as easy-growth breeding developed and grown by the community and local government (Figure 4).

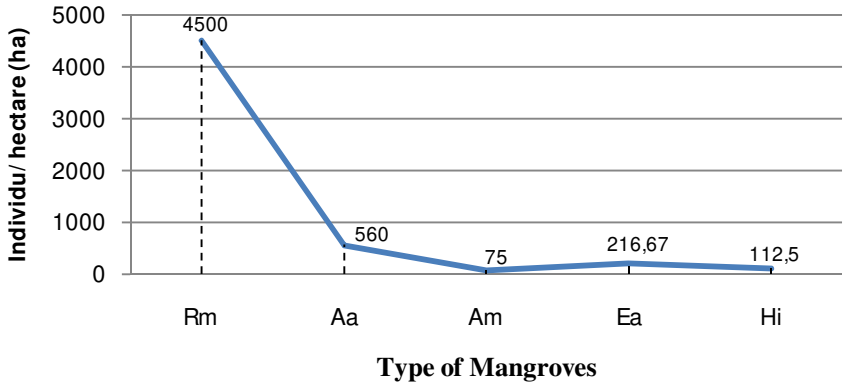

Figure 4. Density of each mangrove species (indv/ha) in Lawangrejo Village (*Rhizopora mucronata* (Rm), *Avicenna alba* (Aa), *Avicennia marina* (Am), *Excoecaria agallocha* (Ea) and *Hibiscus tiliaceus* (Hi))

According to community leaders of Lawangrejo village, mangroves in the village was intensively grew well, even still quite widespread around 1980. But starting in 1990, many died hit by a wave, abrasion and some people cut down for firewood. There was also the clearing of mangrove areas for use as farming purpose in Lawangrejo village. In early 2000, government with communities and NGOs started to plant mangroves along the coast of Lawangrejo village, including vacant land around river mouth and shoreline.

Related with the change of the ecosystem in this village, most people stated that the conversion of mangroves use has forced the sea water to directly strike the near coast area. This situation can lead into lower quality of environment and also reduce productivity of agriculture.

Communicative Education in Community Level

Operational management assistance and rehabilitation of mangrove ecosystems is implemented by developing methods of IEC (Information, Education and Communication). Communication and information are confirmed primarily through training and counseling. Lawangrejo community is prepared This training is an activity that provides *two-way* communication between the community and its stakeholders, the facilitator (NGOs) and the community, and also among community members itself.

Counseling is a non-formal education system which people are shown how to get things satisfactorily, while they working on their own or learn to do it by themselves. In Lawangrejo, this activity contains discussion in community level. This session is focused on the problem identification and followed by training to mangrove knowledge sharing.

Activities in discussion and provision such as laws governing the management of mangrove ecosystems, local regulations as well as information about the technical management of mangrove ecosystems on target and expected positive results of the implementation of the conservation of mangrove ecosystem. While the information activities and physical education can be done through the installation of board invitations, warnings or restrictions on the area of mangrove ecosystems, to sustainability can be maintained (Figure 5).

Figure 5. Warning information board in mangrove forest to avoid destruction (Survey, 2011)

Training and counseling activities are intended to give meaning to society and refresh knowledge of the local community about the functions, benefits of mangrove ecosystems and how the management and rehabilitation of mangrove ecosystems with the sharing of experiences among people with the resources. These activities run systematically, by simple made curriculum system. The training curriculum is divided into several themed with training modules, namely:

1. Functions, benefits mangrove forest rehabilitation and improvement framework conditions in coastal region.
2. Breeding, cultivation and management of mangroves.
3. Institutional strengthening and Social Monitoring System which called *Sistem Pengawasan Masyarakat* (*Siswamas*) in managing of mangrove forest.

Participatory Involvement in Coastal Disaster Risk Reduction

Institutional contribution inventory produce significant information regarding the community capacity in disaster risk reduction. The consultative process informs that people are more enjoy having connection with the local institutional instruments like RT or RW, although the consequences of a longer processing time. Institutions such as village and BPD LPMD do not contribute maximally. During these institutions only deal limited functions, while the community yet so perceived role. While the existence of the farmer farms still felt by society because its activities are limited to those areas. For problems logging especially coastal

mangrove Lawangrejo Village is still no clear coordination between village officials, farmers and community groups about ways to overcome them (Figure 6).

Figure 6. Community instrument contribution inventory on disaster risk reduction (Analysis: 2012)

Local Mangrove Management

Several local initiations with local government collaboration in order to reduce the damage also lead by local instrument like *rembug desa, musrenbang*, and *rapat RT/RW* in Lawangrejo village (Figure 7.a). These instruments mainly discuss the problem or issues in the neighborhood until sub-districts level especially hazard or disaster events in their own places. The community rely their prominent figure like household chief "*Pak RT/RW*" to negotiate and make promising program in coastal flood adaptive strategy. Mangrove planting has been made to reduce and overcome the huge impact of coastal flood as well as to improve the ecosystem and living hood quality through local mechanism, also law for mangrove protection agreement to keep mangrove sustainability in the future.

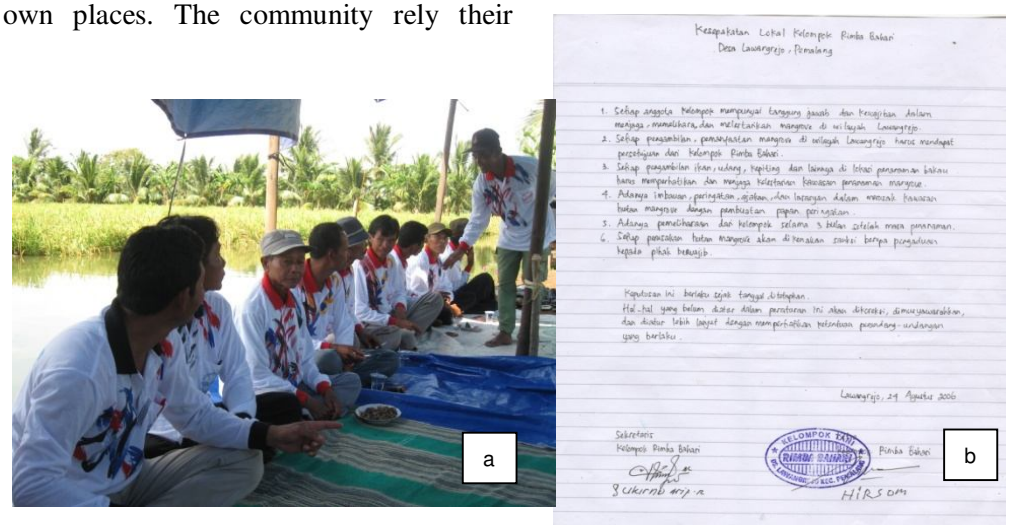

Figure 7. a) Community contribution in proposing mangrove protection agreement b) Local agreement in mangrove ecosystem protection (*Rimba Bahari* documentation)

Coastal community in Lawangrejo village has already known and concerned about environment, especially coastal mangrove ecosystems. This community has understood the importance and the benefits of mangrove ecosystems in the environment regarding to their experience in flooded situation. They agree to manage mangrove ecosystems as part of their responsibility as coastal residents. In addition, the environment is also conductively protected together to optimize growth of mangrove ecosystems. These people usually planted mangroves on the banks of ponds and even in the middle of the pond area as silvofishery system by their self initiation. In the other hand, problem identification also objectively discussed in the internal meeting

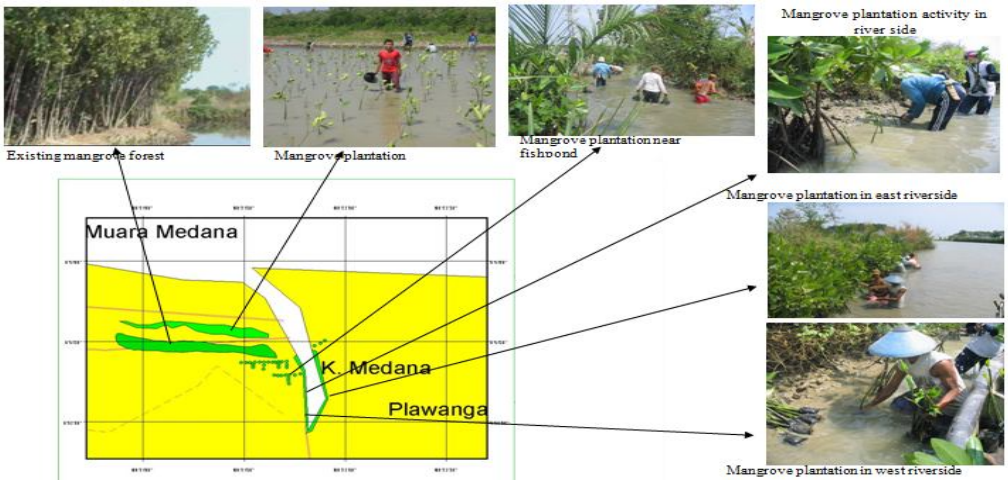

Figure 8. Mangrove planting which organized by local community sponsored by local government

Participative Strength in Disaster Risk Reduction

The participatory is powerful in building community supports. Elaborative discussion dealing with the progress of situation including flood period when it happen in the past years will commits all community to reduce the potential damage that might be happen in the future. This activity communicates historical experience of local inhabitants of coastal flood hazards within subjectivity ideas. In the other way, the mapping activity relates local indigenous information with the spatial information. This is meant to be simple participatory GIS which collected by consultative process during the problem identification (Figure 8). Question and statement during the process have been organized in order to give the basic or even intermediate explanation about coastal flood historical experiences. High enthusiasm will be great entrance to build conducive situation and bring scientific ideas in simple communicative language.

Mangrove planting as community action in disaster risk reduction affirms the capacity of community into real activity due to the hazard occurrence in living places. Government and NGO join in mutual position related the issues and submit the community recommendation into real decision and action. This basic cooperation will collaborate into several programs that will optimize the government existence in the coastal community as vulnerable place inhabitants. The directive interaction of three elements in society will create benefits to the future works (Figure 9).

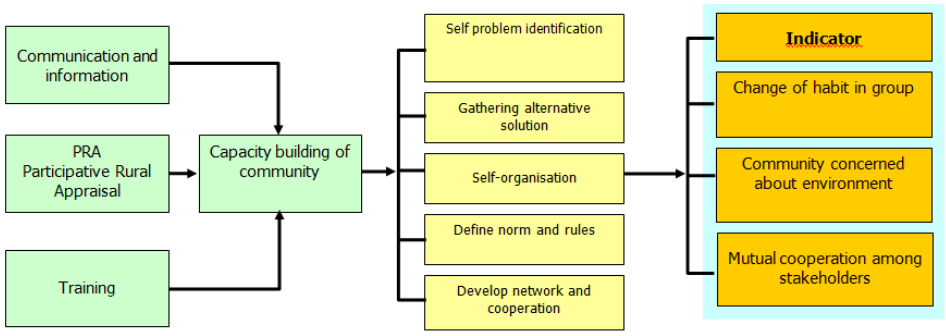

Figure 9. Collaborative process in the community cooperation

V. DISCUSSION

Mangrove community establishment

Mngrove community in Lawangrejo was established based on the coastal flood situation. Bottom-up initiation has provoke the head of the village to make program related with the coastal flood reducement.

At the beginning of the activities are done either to the Government socialization Pemalang and target groups. At first, socialization was held on June 28 and July 7, 2006 at home Mr. Hirsom, head of the *Rimba Bahari* as farmer group in Lawangrejo. During the meeting Lawangrejo villagers welcomed the event to be conducted because they feel there needs to be action to address coastal damage which has occurred in the area during this time. In addition to the enthusiasm was so great because during greening coastal conducted so far only physical activity without any public assistance.

Initiative meeting constructs cooperative discussion to address coastal damage that has occurred in the area during this time. Furthermore, the mangrove plantation is welcomed by community as well as plantation activity which organized together between community, government and NGO. During the session, many participants in Lawangrejo confirm several issues related with environmental and non environmental problems in their village. (see table 2)

Table 2: Problem inventory based on villager information in Lawangrejo

No	Problem
1.	Waste contamination on coastal
2.	Erosion of Plawangan river
3.	Mangrove destruction
4.	Fish production decrement
5.	Financial capital problem for fisherman
6.	Unavailability access to the beach
7.	Water deficient in Siguwu
8.	Low awareness in mangrove conservancy
9.	The absence of drainage system in the village
10.	Abrasion
11.	Low quality of road
12.	Members of organization are not maximally functioned
13.	Areal of mangrove still small
15	Many dead mangrove seedlings

Based on the problem inventory, community reasonably formulate idea to rehabilitate the mangrove forest as solution to reduce the hazard sequence related to coastal flood. The purpose of this activity is to strengthen coastal area from the wave that may increase and followed by the coastal flood. Around 50 thousand mangrove seedlings in the coastal village of Lawangrejo rod. This idea is followed by the Ministry of Marine and Fisheries Affairs of Pekalongan to deliver seeds as part of the rehabilitation program that already launched that year. Guide and assistance for people to find a suitable and safe planting location. In the meeting also agreed several step of seedlings preparation and planting plans.

Contribution in Disaster risk reduction program

Community assistance in preparing the work plan (RKM) were improved by Technical of Participation (TOP). This approach encourages the active participation of the target group to examine the issues that arise in the village Lawangrejo whether related to the management of green belt or other aspects including socio-economic. From the results of the study these issues further efforts to formulate solutions to optimize and utilize all its potential. Capacity building of the community also held by the local government The workshop management of community-based the green belt was held at Development and Planning Board (Bappeda) office of Pemalang. This meeting results several program that indicates disaster risk based on the preliminary meeting in the community level. (see tTable 3)

Table 3. Action plan of mangrove community (*Rimba Bahari*) in Lawangrejo village including disaster risk reduction program

Problem	Alternative solution	Time	Person in charge
Waste contaminati on on coastal area	Socialization of coastal destruction impact and law enforcement	Sustain-able	a, b
Erosion of Plawangan river	• Building dikes • River dredging • Mangrove replant	Sustain-able	a, b
Mangrove destruction	• maintanance • law enforcement and society enlighment about mangrove benefits • mangrove monitoring	Sustain-able	a, b, c
Fish production decrement	Fish feeding training	Sustain-able	a, b
Financial capital problem of fishermen	• Financing proposal • Bank approaching program	Sustain-able	d
Unavailability access to the beach	Road proposal in community mangrove forest (HBR)	2006	a
Water deficient in Siguwu	Building structure to connect Plawangan and Siguwu river	2008	a, b
Low awareness in mangrove conservancy	• Routine monitoring • Law enforcement	Sustain-able	b
The absence of drainage system in the village	Drainage proposal for government	October 2008	a, b
Abrasion	• Coordination with government • Mangrove planting • Dikes construction to reduce waves	October-Decem-ber 2006	a, b
Low quality of road	Road improvement program with concrete	2007	a
Members of organization are not maximally functioned	Meeting and training	Every month	b
Areal of mangrove still small	50,000 seeds of mangrove planting	mid July. of 2006	b
	Second stage of mangrove planting near Plawangan river	mid. August 2006	b
Many dead mangrove seedling	Maintenance	Sustain-able	d, e, f

Source: Analysis (2012)

a) Head of village
b) Head of Rimba Bahari
c) Police and military
d) Ministry of ocean and fisheries affair

e) Forestry department
f) Environmental department

Regarding from the initial meeting, utilization of mangrove by society organized in spirit of to protecting and preserve. Meanwhile, the local government as policy maker should be firm in upholding the rule of law relating to the management of coastal areas. Management of mangrove Lawangrejo based on the agreement work plan and contains mangrove maintenance, repair and development of new areas. *Rimba Bahari* as initiated groups consist of villagers who have agreed to maintain the mangrove, as part of their living hood. Elaborative communication between the group and local government positively agreed in terms of supporting the community in mangrove forest management. Local instrument propose higher authorities with guidance to sponsors local forest management which constructed in the local agreement in Lawangrejo community and administrators of the *Rimba Bahari*. Contain of the rules are described as follows:

1. Each group member has a responsibility and obligation to maintain, preserve and conserve mangroves in Lawangrejo.
2. Every decision, benefit in the area of Lawangrejo mangroves must be approved by *Rimba Bahari*.
3. Captured fish, shrimp, crabs and other mangrove planting sites should pay attention to and preserve the mangrove planting.
4. Warning board manufacturing appeals, warnings, and solicitation in damaging the mangrove forest.
5. Mangrove forest maintenance gathered by the group during 3 months after planting.
6. Any destruction of mangrove forests will be penalized in the form of a complaint to the authorities.

VI. CONCLUSION

It is important to establish a common understanding of the basic tenets of disaster risk reduction as this review addresses the community. The outlooks, abilities and practices that are presented here are distinctive from those elements and understanding conventionally related to emergency or disaster management. These bodies of practice have been known, variously, as civil defense, emergency assistance, disaster response and relief, humanitarian assistance, emergency management, civil protection, disaster mitigation and prevention, and total disaster risk management.

Mangrove forest management should be integrated by the community, government and other stakeholders professionally and competent. Coastal community in Lawangrejo village, Pemalang regency has built cooperative system to coastal flood avoidance in their area. Participative collaboration within community, local government and NGO creates real action plan including problem identification, survey and mapping, until mangrove plantation as alternative solutions for coastal disaster risk reduction. The disaster risk management is already modified into basic need of ecosystem rehabilitation with high concerning of community participation.

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