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Bringing a GSCA model into costal restoration for community groups of supervisors management in coastal East Java Province in Indonesia

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Abstract

The fishery sector in Indonesia contributes substantially to the domestic product reaching nine percent by the end of 2017. This success is followed by one of 35 provinces in Indonesia is East Java province. The contribution of East Java province's fishery sector to Gross Regional Domestic Product of East Java reached IDR 41.89 trillion or 2.48 percent with economic growth reaching 5.58 percent. However, this achievement will be threatened in the future, if the mangrove forest damaged covering 13,000 ha of the 85,000 ha is not restore properly. To overcome this damage, the Government of Indonesia has encouraged the formation of Groups of Supervisory Society. It is expected to contribute optimally to the implementation of coastal restoration in East Java province. Therefore, the sample location is taken a case study in the Lembung village, in Pamek as a regency. The purpose of this study is to find out how optimal the role of the Groups of Supervisory Society for coastal restoration. The method used is Generalized Structured Component Analysis (GSCA). The advantage of GSCA is that it can be used on recursive and non recursive structural models with reflexive or normative indicator models. The results of this study indicate that the Groups of Supervisory Society needs to improve the institutional capacity to be able to provide awareness to the community about the importance of mangrove restoration including the ability to arrange restoration program and various activities to prevent the destruction of mangrove forest and increase fishery production.

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Introduction

Mangrove forests are extremely productive ecosystems that provide numerous good and services both to the marine environment and people. The mangrove ecosystem has unique characteristics, because it lives in air and water temperature (warm). Mangrove has a substrate type of mud/clay and has the ability to provide protection from high wave energy, the presence of saltwater, tidal currents of the ocean. (O'Sullivan, 2005). Besides that mangroves are habitat for large variety of fish, crab, shrimp, and mollusk species. Mangrove wood is extremely valuable as for fuel, home construction, commercially harvested for pulp, wood chip, and charcoal production. The dense root systems of mangrove forests trap sediments flowing down rivers and off the land. This helps stabilizes the coastline and prevents erosion from waves and storms.

The diversity of life inhabiting mangrove systems, and their proximity in many cases to other tourist attractions such as coral reefs and sandy beaches, it is perhaps surprising that only a few countries have started to tap into the tourism potential of their mangrove forests. Mangrove has a very large function and role in the coastal environment, as stated byLugo *et al.* (2014) that He mentioned that mangroves not only function differently, but also may appear to be exceptions to generalities. For example, some mangroves appear to grow in freshwater, whereas others appear never to flood. In both cases, the incursion of seawater or floods occurs but at very low frequencies that require long-term observation. Meanwhile, strategic role of physical function mangroves are to keep coastline steady, to protect beaches and river cliffs from erosion or abrasion processes, to absorb strong winds from ground to surface, to trap sediment periodically until new land is formed; and to prevent intrusion or seepage of seawater to land, or as a saltwater filter becomes bargaining. Chemical function of mangrove area to keep place of recycling process that produces oxygen, to absorb carbon dioxide, to process waste materials of industrial pollution and ships in the oceans. Mean while, biological function of mangrove area to produce important food source for small invertebrates of weathering eaters (detritus), and then serve as a source of food for larger animals, to provide a spawning or shelter area for shrimps, fish, crabs, shellfish, to provide a source of germplasm and genetic resources; and to provide a natural habitat for different types of terrestrial and marine biota.

Spalding *et al.* (2014) explained that the role of mangroves in protecting coasts against natural hazard such as storms, tsunamis and coastal erosion has been widely acknowledge. In order to improve the management of mangrove ecosystem services, it requires knowledge of geographic, biogeographic and socio-economic settings including responding to global climate change trends, changes in population movements such as urbanization. However, as long as mangrove area management is still modelled traditionally, efforts to address climate change, including preventing destructive natural events, will be difficult. Thus the future model of mangrove management should involve many stakeholders both from around the location and from outside the location (Leel *et al.*, 2014). Tropical mangroves rank among the most productive natural ecosystems in coastal areas globally (Alongi, 2009).

According to McKee *et al.* (2007) that the role of mangrove is vital to reduce, adjust and respond to global climate change through sea level rise. This is done by using mangrove roots that may affect the availability of nutrients. In addition, mangroves are also able to offset the increase of inundation (Alongi, 2008). Heatherington & Bishop (2012) stated that sea level rise can be controlled by mangroves with mangrove standing structure. The above information about the role and function of mangrove strategic is no longer be denied. The problem of mangrove conditions in the world today is experiencing a very poor quality of degradation. According to Valiela *et al* (2001) mentions that the world's mangrove forest area has been reduced by about 35% on a worldwide scale since the 1980s, and 2.1% of the world's mangrove forest lost every year. This condition is similar to the condition in Indonesia, where the

damaged mangrove forests according to the National Coordinating Agency for Surveys and Mapping (2009) states that the area of mangrove vegetation in Indonesia is about 3,244,018.46 ha.

However, mangrove areas have declined in quality and quantity due to conversion activities (ponds, settlements, rice fields) and irresponsible logging. Kusmana & Onrizal (1998) reported that in 1982 mangrove forests in Indonesia were recorded at 4.25 million ha while in 1993 3.7 million ha, of which 1.3 million ha had been leased to 14 forest concession companies (HPHs). According to Bouillon *et al.* (2008) mangroves have global importance because their carbon sequestration and dynamics are in the same order as the unaccounted global carbon sinking. Mangroves are also important to the functioning of coastal ecosystems, and have economic and cultural importance to people (FAO, 1994). As stated by Martinuzzi *et al.* (2009) that mangroves can recover from deforestation, if socioeconomic and environmental conditions are favourable. Based on the study of literature previously (Lee *et al.* (2014), Diefenderfer *et al.* (2003), Lugo *et al.* (2014), that the restoration of mangrove could be successed if there is community participation. Therefore, it is necessary to have socio-economic conditions that support the success of mangrove restoration efforts with cooperation between government and society. The intended component of society is a society that builds itself through an organization called The Supervisory Community Group (Pokmaswas). Such group is formed by the community itself with its legality established by the local government. The main tasks of these community groups is to manage mangrove damage from planning, organizing, implementing to monitoring and evaluation. Therefore, the purpose of this study is to find out how optimal the role of the Groups of Supervisory Society for coastal restoration. The method used is Generalized Structured Component Analysis (GSCA). The work previously done by Yuliana *et al.* (2012) stated that members of the Supervisory Community Group have a high concern about their duties and responsibilities to assist the government to oversee and safeguard the marine environment and the preservation of the marine environment, including the destruction and theft of fish. For that the members of the community group always write a report for each violation that occurred. The objective of this study is to investigate the works of local community to support the mangrove restoration through the local Supervisory Community Group by using GSCA model.

Materials and methods

GSCA Model

To know how effective the role of Pokmas was improves mangrove conditions, it is necessary to test through a model called the Generalized Structured Component Analysis (GSCA). GSCA analysis is a model of component-based structural equations to examine the relationship of multiple component sequences by merging data reduction through path modell. This analysis is used to test several components through the merging of the reduced data (Hwang & Takane, 2004). Through the GSCA can be seen the real role of all the role of existing stakeholders. To conduct GSCA analysis, it is necessary to approach the case study by taking sample Pokmaswas Lembung village, sub district Galis, Pamekasan regency. The location of this study was chosen because the condition of mangrove damage represents the average condition of mangrove in East Java province (see Fig. 1 below). Table 1 is shown below indicate the number of respondents to be interviewed to identify which one of the parties involved responsible to conduct mangrove restoration.

Table 1. The number of respondents in Lembung Village, Sub District Galis, Pamekasan Regency, East Java Province, Indonesia.

Types of Respondents	Number of Respondents
Forestry office, Pamekasan Regency	5
Fisheries and Marine office, Pamekasan Regency	5
Development Planning Office, Pamekasan Regency	5
Environment Office, Pamekasan Regency	5
Salt Enterprise	6
Pokmaswas	5
Total	31

Desciption of Research Location

The total area of Lembung village is 356,618 ha. Of the total area, the dominant scenery in this village is the extent of pond land/pond owned by some residents with the composition of the land area of 233.1 Ha. In addition, the other area consists of 40,855 hectares of settlements, and rice fields of 48.60 Ha, while the rest is used for public facilities and infrastructure such as land granted and cemetery ground. The mangrove forest in Lembung village has an area of 28.80 ha with a damage rate of 17% (4.6 ha). But it has been getting treatment from various parties in the form of rehabilitation in the mangrove area. However, the rehabilitation program is deemed ineffective so it is necessary to restore to maintain the sustainability of mangrove area so that the ecological balance will be maintained.

Therefore, it is necessary to minimize the adverse effects of mangrove forests due to anthropogenic processes through restoration measures to maintain the presence of mangroves. Restoration is an action to restore something in its original state. Restoration is also a means of restoring degraded land into original or near original conditions, through the management of ecosystem structures, functions and processes in the mangrove ecosystem, and preventing it from extinction, including enriching and sustaining the sustainability of natural resource production, coastal areas, and socio-cultural functions.

Fig. 1. Map of Research Location.

Table 2. Types of Mangroves.

No	Types of mangroves	Station		
		Station 1	Station 2	Station 3
1.	RhizoporaMucronata	V	V	V
2.	RhizoporaStylosa	-	V	-
3.	Avicennia Marina	V	V	V
4.	Sonneratia Alba	V	-	V

Source: Qomariyah, Dewi Nur (2016).

Condition of Mangrove

The results of field analysis by Qomariyah (2016) yielded data on: mangrove irritability, water quality conditions, and formulated a restoration strategy plan for the management of mangrove ecosystems. Table 2 below shows that the results of identification at the study sites, mangrove species found in Lembung Village consist of *Rhizopora mucronata, Rhizopora stylosa, Avicennia marina* and *Sonneratia alba*. The spread of these types of mangrove vegetation is uneven throughout the coastal villages of Lembung. There are several types found only in one place, but not found elsewhere. In table 3 found at station 1, that mangrove species have high significance index value

that is *Avicennia marina,* while at station 2 and 3 is *Rhizopora mucronata* species. Types of mangroves that obtain a high Important Index Value value indicate that the species has more habitat control. In the mangrove area of Lembung Village, *Avicenna marina* and *Rhizopora mucronata* species have density value of type, frequency of type and closure is higher than other species. *Rhizopora mucronata* species is a mangrove species that has an advantage in adapting to local water conditions (Suryawan, 2007).

Table 3. Damage rate of mangrove ecosystem of Lembung Village.

	Types	DK (Ind/Ha)	RDk (%)	RFk (%)	RCk (%)	INP (%)	Density Level
	Avecennia marina	433,34	54,17	50	29,66	133,82	
1	*Sonneratia alba*	266,67	33,34	33,3	46,00	112,66	
	Rhizhopora mucronata	100	12,5	16,6	24,33	53,5	Rarely
		800	100	100	100	300	
	Rhizhopora mucronata	400	48	50	42,42	140,42	
2	*Rhizhopora stylosa*	300	36	33,3	32.93	102,26	
	Avecennia marina	133,34	100	100	100	300	Rarely
	Rhizopora mucronata	233,34	41,18	40	29,62	110,8	
3	*Sonneratia alba*	166.67	29.41	40	34,26	013,68	
	Avecenia marina	166.67	29.41	20	36,10	85,51	Rarely
SUM		566,6	100	100	100	300	

Source: Qomariyah, Dewi Nur (2016).

Remarks:
DK (Ind / Ha): Density of a Kind
RDk (%): Relative Density of a Kind
RFk (%): Relative Frequency of a Kind
RCk (%): Relative Closure of a Kind
INP (%): Important Value Index

Table 4. Assessment system of mangrove criticality level of Lembung village.

No	Criteria	Weight	Score	Remarks	Max value	Total scoring value	Percentage
1.	Type of closure and land use type of closure and land use	30	2	Mangrove forests mixed with non-vegetation land use (Settlements, ponds, non-intercropping)	150	60	12 %
2.	number of trees/ Ha (N)	25	1	N < 1.000 Tress/Ha	125	25	5 %
3.	Regeneration/Ha (Np)	20	5	Np= 5000 seedling/Ha N = 2500 Stake/Ha (F= 60 %)	100	100	20 %
4.	The width of the mangrove green line	15	2	40% - 80% (130 x PPS)	75	30	6%
5.	Abration Rate	10	5	0 – 1 meter/year	50	50	10 %
				Total	500	265	53 %

Source: Qomariyah, Dewi Nur (2016).

Results and discussion

The Role of Stakeholder Analysis and GSCA Analysis

Management of coastal areas in the research area depends on the role of local government areas, especially the village government. Financing the management for the construction of facilities and infrastructure as an effort to maintain the preservation of coastal ecosystems, it is highly dependent of the role of local government, and the village government that maintain it. However, in the process, coastal conservation efforts through rehabilitation programs undertaken by the government and inviting communities are not effective. The construction of facilities and infrastructure including replanting of mangrove is slow. The local government seeks to establish and issue regulations relating to the restoration of degraded mangrove forests by encouraging

community participation, including involving the private sector such as cement companies in the research area. The various efforts that have been made with community involvement reap unsatisfactory results. The government's approach encourages the participation of the community is not as expected. The government invites the community in the planning process only in the development plan deliberation program initiated by the Regional Development Planning Board. However, it often happens that community participation is merely a lip service to prove community participation. The results obtained after delaberations often not in accordance with the expected results of society. This apprehensive condition then encourages the real role of society with mobilizing society itself.

The mechanism is that the community appoints its own leader through a deliberation process. After the leader is appointed then the appointed leader elects his "cabinet" to undertake the division of tasks with the aim of restoring coastal ecosystems.

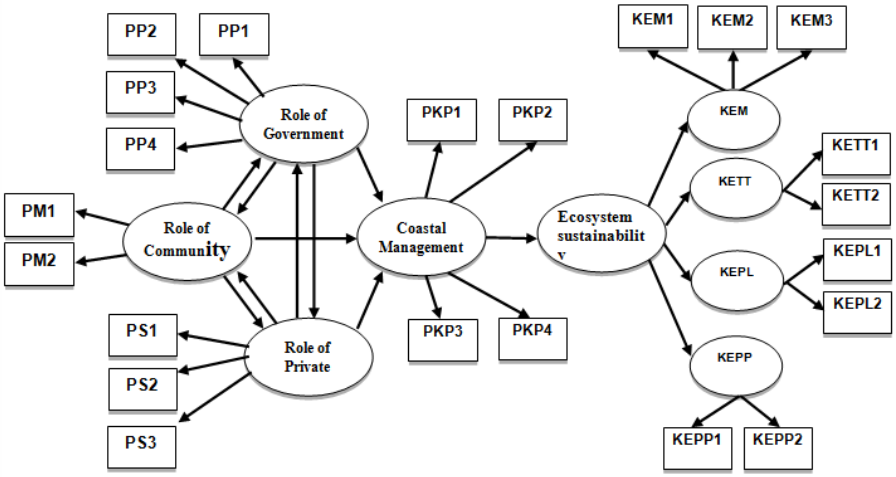

Fig. 2. Model Structural of GSCA.

Legends:

PP	: The Role of Government	PKP	: Coastal Management
PP1	: Implementation	PKP1	: Involvement
PP2	: Supervision	PKP2	: Availability of funds
PP3	: Evalaution	PKP3	: Synergy
PP4	: Planning	PKP4	: Evaluation
PM	: The Role of Community	KEM	: Sustainability of mangrove ecosystem
PM1	: Implementation	KEM1	: The damage is reduced
PM2	: Supervision	KEM2	: Small fish seeds increase
PS	: The Role of Private Sector	KEM3	: wise and responsible
PS1	: Conservation	KETT	: Sustainability of coral reef ecosystems
PS2	: Implementation	KETT1	: Coral reefs are widely visible
PS3	: Evaluation	KETT2:	Coral reefs are awake
KEPL	: Sustainability of seagrass	KEPP	: Sustainability of coastal sand ecosystem
KEPL1	: Clean seagrass beds	KEPP1	: A little garbage strewn on the beach
KEPL2	: seagrass beds are awake	KEPP2	: The beach sand is clean

Based on the results of the analysis in the above table, it is known that all indicators result in load factor value > 0.5.

Then the AVE value of all variables> 0.5, and the value of cronbach's alpha> 0.6. Thus indicators that measure the role of government, the role of society, the role of the private sector, and the managers of coastal areas, and ecosystem sustainability are valid and reliable.

In the government role variable, the planning indicator (PP4) has the largest loading factor value and the supervisory indicator (PP2) has the lowest loading value. This suggests that planning indicators (PP4) have the greatest contribution in measuring government role variables. Meanwhile, supervisory indicators (PP2) have the lowest contribution in measuring government role variables. In the community role variable, the implementation indicator (PM1) has the largest loading factor value and the monitoring indicator (PM2) has the lowest loading value. This indicates that implementation indicators (PM1) have the greatest contribution in measuring the role variables of society.

While the monitoring indicator (PM2) has the lowest contribution in measuring the role variables of the community.

In private role variables, conservation indicators (PS1) have the largest loading factor value and implementation indicators (PS2) have the lowest loading values. This indicates that conservation indicators (PS1) have the greatest contribution in measuring private role variables. Meanwhile, implementation indicators (PS2) have the lowest contribution in measuring private role variables.

In the coastal management variable, the synergy indicator (PKP3) has the largest loading factor value and the engagement indicator (PKP1) has the lowest loading value. This shows the synergy indicator (PKP3) has the largest contribution in measuring the variables of coastal area managers. Therefore the engagement indicator (PKP1) has the lowest contribution in measuring the variables of coastal area managers. In the wise and responsible dimensions (KEM3) has the largest loading factor value and the reduced damage indicator (KEM1) has the lowest loading value. This indicates that small fish seed indicator increases wise and responsible variable (KEM3) by having the biggest contribution in measuring the dimension of preservation of mangrove ecosystem. The reduced mangrove damage indicator (KEM1) has the lowest contribution in measuring the dimensions of the preservation of mangrove ecosystems.

In the conservation dimension of coral reef ecosystems, the safest coral reef (KET2) indicator has the greatest loading factor value and the most visible coral reef indicator (KET1) has the lowest loading value. This indicates that the coral reef indicator maintained (KET2) has the greatest contribution in measuring the dimensions of coral reef ecosystem sustainability. The most visible coral reef indicators (KET1) have the lowest contribution in measuring the dimensions of coral reef ecosystem sustainability. In the dimension of seagrass ecosystem sustainability, seagrass-maintained seagrass indicator (KEPL2) has the largest loading factor value and has clear seagrass indication indicator (KEPL1) has the lowest loading value. This indicates that the indicator of seagrass beds maintained (KEPL2) has the greatest contribution in measuring the dimensions of the seagrass ecosystem. While the indicator of clean seagrass beds (KEPL1) has the lowest contribution in measuring the dimensions of the seagrass ecosystem.

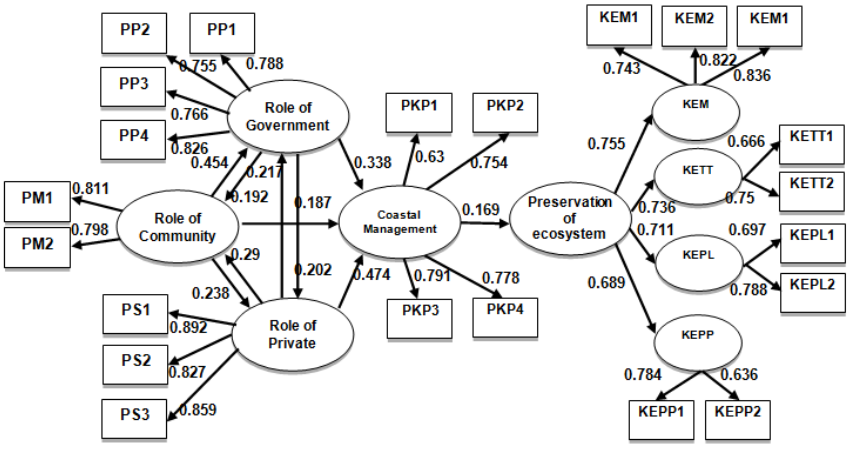

Fig. 3. Analisys of GSCA Structural Model.

In the dimensions of coastal ecosystem sustainability, slightly scattered waste indicators on the coast (KEPP1) have the greatest loading factor values and clean beach sand indicators (KEPP2) have the lowest loading values. This indicates that the slightly scattered waste indicators on the beach (KEPP1) have the greatest contribution in measuring the sustainability dimensions of coastal sand ecosystems,

while clean beach sand indicators (KEPP2) have the lowest contribution in measuring the sustainability dimensions of coastal sand ecosystems. In the ecosystem sustainability variable, the dimension of sustainability of mangrove ecosystem has the largest loading factor value and the dimension of sand ecosystem preservation has the lowest loading value. This shows that the dimensions of sustainability of mangrove ecosystems have the greatest contribution in measuring ecosystem sustainability variables, and the dimensions of coastal sand ecosystem sustainability have the lowest contribution in measuring ecosystem sustainability variables. In the structural model evaluation of table 5 below, it is intended to determine the feasibility of the model and to test the hypothesis of the effect of exogenous variables on the endogenous variables.

Table 5. Structural Model evaluation.

Exogen	Endogen	Estimate	CR	FIT	GFI
PP	PM	0.217	2.170*		
PP	PS	0.202	2.149*		
PP	PKP	0.338	6.898*		
PM	PP	0.454	7.828*		
PM	PS	0.238	3.662*	0.657	0.952
PM	PKP	0.187	2.226*		
PS	PP	0.192	2.233*		
PS	PM	0.29	4.677*		
PS	PKP	0.474	8.316*		
PKP	KE	0.169	2.061*		

The results of the analysis listed in the above table obtained GFI value of 0.952. It shows the value of GFI> 0.9 which states that the GSCA model is formed feasible used to predict. FIT value of 0.657 shows the diversity of data can be explained by the model of 65.7%, while the rest of 34.3% is explained by other variables outside this study.

The results of the analysis in the above table also inform the influence of the role of government on the role of society produced coefficient of 0.217 with the value of the critical ratio (CR) of 2.170* (starred or CR> 2.00). This means there is a significant influence the role of government on the role of society. The role of the government in preserving the coastal village of Lembung is likely to increase the community's role in preserving the coastal villages of Lembung.

The influence of government role on private role resulted coefficient of 0.202 with critical ratio value (CR) of 2,149* (star or CR> 2.00). This means that there is a significant influence on the role of government in the role of the private sector. The better the role of the government in preserving the coastal villages of Lembung is that it tends to increase the private role in preserving the coastal villages of Lembung.

The influence of government role on coastal area management resulted coefficient of 0.338 with critical ratio value (CR) of 6,898* (star or CR> 2.00). This means that there is a significant influence on the role of government to manage coastal areas. The better the role of government then it tends to improve the management of coastal areas. The influence of public role on the role of government generated coefficient of 0.454 with the value of the critical ratio (CR) of 7,828* (starred or CR> 2.00). This means that there is a role of the community in preserving the coastal village and then to the role of government in preserving the coastal village of Lembung.

The influence of public role on the role of private generated coefficient of 0.238 with the value of critical ratio (CR) of 3.662* (star or CR> 2.00). This means there is a significant influence the role of society on the private role. The better the role of the community in preserving the coastal villages of Lembung, the better the role of the private sector in improving the role of preserving the coastal villages of Lembung. The influence of the private role on the role of government produced a coefficient of 0.192 with the critical ratio (CR) of 2,233* (star or CR> 2.00). This means that there is a significant influence of the private sector's role to the government role. The better the private role in conserving the coastal villages, the better the government's role in preserving the coasts of the village of Lembung.

The influence of the private role on the role of society produced a coefficient of 0.29 with the critical ratio value (CR) of 4,677* (star or CR> 2.00). This means that there is a significant influence on the role of the private sector. The better the private role in preserving the coastal villages of Lembung, the better the role of the community in preserving the coastal villages of Lembung. The influence of private role on coastal area management resulted coefficient of 0.474 with critical ratio value (CR) of 8,316* (star or CR> 2.00). This means that there is a significant influence on the role of private sector management of coastal areas. The better the private role involved in coastal management, the better in managing coastal areas. The influence of coastal area management on ecosystem sustainability resulted coefficient of 0.169 with critical ratio value (CR) of 2,061* (asterisk or CR> 2.00). This means that there is a significant effect of coastal management on ecosystem sustainability. The better the management of coastal areas, the better the tendency to improve ecosystem sustainability.The role of the private sector is known to be the most influential variable on the role of the community, and coastal management. On the other hand, the role of the community becomes the most influential variable on the role of government and private role.

Pokmaswas as the spearhead of coastal restoration

Based on the results of GSCA analysis above, it is found that the role of society becomes a central role to improve coastal ecosystem sustainability. Although, the role of government and private sector are also becomes an important variable to support the role of society. The role of the community is established collaborating and netwoking among parties involve to preserve coastal ecosystems and tobe the front guard in coastal management. The community established a Supervisory Community group (Pokmaswas) tasked with coastal restoration. Pokmaswas gait is supported and endorsed by regents or mayors. Ratification of Pokmaswas as a good legal step for government and community to preserve coastal area management. The GSCA analysis has results as a tool to prove that actual community participation is handed over and handled by the community itself with the support of the government and the private sector.

The formation of Pokmaswas that is only formal and it is formed by the government only as a justification that the government has fulfilled the demand to accommodate the aspirations of the people. Whereas,the reality in the field, that Pokmaswas formed by the government, it is not running as expected. Many Pokmaswas conditions are currently suspended animation.

Based on Law Number 45 Year 2009 concerning Marine and Fisheries Supervision, the Minister of Marine Affairs and Fisheries issued Ministerial Decree Number: KEP.58 /MEN/2001 on Procedures for Implementation of Community Oversight System in Management and Utilization of Marine and Fishery Resources stated thatthe task of Pokmaswas is a field supervisor consisting of community leaders, religious leaders, customary Fig.s, community institutions, fishermen, fish farmers and other maritime communities.

The legal basis for the formation of Pokmaswas is in article 67 of Law No. 31 of 2004 on Fisheries, namely that people can be included in fishery supervision. The law is described in the Decree of the Minister of Marine Affairs and Fisheries number KEP.58/Men/2001 on the procedures for implementing Siswasmas in the management and utilization of Marine and Fishery resources.The establishment of Pokmaswas is in accordance with existing regulations. However, its functions and roles do not go according to its function. This is because Pokmaswas rarely get adequate assistance from the local government either in the form of mangrove seeds or operational funds. As a result, Pokmaswas conduct self-help activities and the results are not optimal. In order to optimize the role of Pokmaswas, they prepare the spesific objective as seen table 6 below.

Furthermore, the Minister's decision is translated into a Decision Letter of the Director General of Marine and Fishery Resources Supervision Number: 25 A/Kep.

DJSDKP/2015 on Technical Guidelines for Assessment and Awarding of Supervisor of Fisheries Exemplary, Exemplary Police, Supervisory Supervisor, Exemplary Civil and Exemplary Group in the Directorate General of Marine and Fishery Resources Control.

Table 6. The objective of Pokmaswas.

No	Objectives	Remarks
1.	To raise awareness and to encourage public awareness, the role of the Supervisory Community Group is essential for mangrove restoration, through the Forum Group Discussion (FGD) between Pokmaswas and communities and fishermen;	The role of local government to provide such FGD by providing appropriate facilities.
2.	To structure the workings of the restoration, The Supervisory Community Group shall plan the mangrove restoration by preparing the Medium Term Program within 5 (five) years on the mangrove forest area to be restored, the priority of restoration handling such as restored land area, and annual financing plans, including the source of its financing.	The local Government and private sector could be sponsored.
3.	To plan the establishment of mangrove seeding and plantation on mangrove land that will be restored with the time frame according to the allocation in the Medium Term Program that has been prepared;	The local Government and private sector could be sponsored.
4.	To provide counselling on destructive fishing gear and which should be used in the context of the implementation of sustainable marine development;	The local government introduce environmentally friendly fishing gear
5.	To accelerate the implementation of the restoration, The Supervisory Community Group also provides encouragement and motivation for fishermen's wives to model a mangrove-based poly culture to support mangrove restoration.	The government also encourages fishermen to build their own businesses.

Based on the above objectives, the task of Pokmaswas in outlineis to observe, monitor, hear and report on any occurrence. The substance of the reporting includes the location of the offense, the time of the incident, the form of the offense, the identity of the offense, the witness who sees the offense and the chronological violation. Authority of Pokmaswas, firstly, arrest the perpetrators of the caught fishing crime which then handed over to the fishery supervisor or local law enforcement apparatus. Second, propose to the licensor to impose sanction on the offender of the criminal offense of the fishery. Third, coordinate for fisheries supervisor and law enforcement apparatus.

Thus, the role of Pokmaswas is part of the overall supervisory system, the partner of the fishery supervisor, the monitoring of the implementation of the field of fishery law in the field, the source of early information on the occurrence of violation of fishery crime, for example and the reporter of the orderly conduct of business for the surrounding community, not as a judge for criminal offenses by imposing penalties, not as government agents.

Medium-Term Action Plan on Mangrove Retoration

Preparation of Pokmaswas action plan framework over the next 5 years is prepared with coastal ecosystem management approach. Such approaches include planning stages, organizing stages, actuating and controlling stages. Such framework is built based on Diefenderfer *et al* (2003). The main objective of preparing action plans undertaken by Pokmaswas is to promote the restoration of coastal ecosystems especially for mangroves. In addition, restoration is directed at restoring biodiversity loss, restoring connectivity among ecosystems, increasing resilience and ecosystem services, mechanisms to increase public knowledge about climate change, combat desertification and land degradation. The action plan can also contribute to the achievement of objectives and commitments under local government regulation through strategic plan. Mangrove restoration refers to the process of managing or assisting the recovery of an mangrove ecosystem that has been degraded, damaged or destroyed as a means of sustaining ecosystem resilience and conserving biodiversity. mangrove degradation is characterized by a decline or loss of habitat or reducing ecosystem functions.

The action plan aims to facilitate mangrove ecosystem restoration across of habitat, biomes and ecosystems. Actions intended to reduce, mitigate or reverse direct drivers of degradation, restore mangrove ecosystem conditions and processes may be undertaken on a range of scales within a mosaic of land uses, for a range of purposes and with different actors. Actions on the village scale are necessary to provide an enabling institutional framework.

In relation to the preparation of the action plan, then it refers to UNEP (2016) that key action plan activities include: a) Assessment of opportunities for ecosystem restoration;(b) Improving the institutional enabling environment for ecosystem restoration; (c) Planning and implementation of ecosystem restoration activities; and (d) Monitoring, evaluation, feedback and disseminating results.The action plan formulated by Pokmaswas can be elaborated as follows:

(a) Assessment of opportunities for ecosystem restoration;

Pokmaswas will assess in its entirety in the research location about the area of mangrove area. Mangrove forests are then grouped into mangrove forests of high criticality, moderate and mangrove forest conditions that still have high densities. Pokmaswas subsequently invited communities living on the coast including fishermen and formal and non-formal institutions to attend the Forum Group Discussion (FGD). In this forum, it is expected to produce a program structure to restore the mangrove ecosystem. After that, it is necessary to plan the allocation structure of financing either sourced from the government and self-supporting community, or sourced from private funds through Corporate Social Responsibility (CSR). The action plan must be agreed for 5 (five) years by first estimating the needs of activities for 5 years, institutional needs and financing.

(b) Improving the institutional enabling environment for ecosystem restoration;

Institutional assessment is a very strategic part. This is given that the success of a program lies in the ability of its institutional capacity to plan, to implement, to monitor and to monitor. To that end, local and private governments need to contribute to improving institutional capacity through training programs, internship programs, reviewing and improving or establishing legal, policy, and financial frameworks for ecosystem restoration.

(c) Planning and implementation of ecosystem restoration activities;

Pokmaswas identifies the most appropriate actions from a long list of contributions from communities, governments and private entities to restore ecosystems. In addition, Pokmaswas must have vision, mission and value about restoration of mangrove will be directed to where. It is to consider how ecosystem restoration activities can support the ecological and economic sustainability of the coastal region. Strategic plan documents that have been prepared must have clear and measurable targets, and can be seen the tendency of the gap between planning and implementation. For effectiveness of implementation in the framework of restoration of mangrove ecosystem, Pokmaswas need to develop explicit task, schedule, and budget of implementation. Therefore, there needs to be concrete steps on the steps that are developed and described in the mangrove ecosystem restoration plan.

(d) Monitoring, evaluation, feedback and disseminating results.

Pokmaswas should not be satisfied only in the preparation of the strategic plan document and action plan, but the Pokmaswas should be able to assess the efficacy and impact of the implementation of the mangrove forest ecosystem restoration plan.

If Pokmaswas wish to pursue timeliness, Pokmaswas must adapt plans, expectations, procedures, and monitoring through adaptive management with dynamic conditions. In addition, Pokmaswas need to record the documentation of experience during the lesson both at the stage of planning, financing, implementation and monitoring of mangrove ecosystem restoration plans in collaboration with stakeholders to demonstrate practices and areas that

provide many benefits of ecosystem restoration, identifying consequences that are not desirable and improve the outcomes of future restoration efforts, using this through the national clearing-house mechanisms and global clearing-house mechanisms, inter alia, to exchange information.

Conclusion

The GSCA analysis was able to provide answers on who is actually capable of contributing to coastal management through mangrove restoration of the various stakeholders involved. The GSCA model gives results that the community should be encouraged and motivated as the spearhead of mangrove restoration. Understanding community participation does not mean the government that encourages its formation and then legitimates it. Lessons from experience shows that Pokmaswas formed by the government are not functioning optimally. In this study indicates that Pokmaswas who formed themselves, mobilized themselves and were given full delegation, then such Pokmaswas will successfully run the program. The role of the government, both the district government, the village government and working with the private sector, only serves to encourage and support the Pokmaswas movement.

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