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Social Capital in Mangrove Management: A Case Study in Lampung Province, Indonesia

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Abstract

The objective of this study is to identify the individual characteristics and the elements of social capital hence a suitable design of social capital reinforcement can be proposed to promote a sustainable community-based mangrove management. The research conducted in three villages that were selected based on mangrove ecological differences in Lampung Province, Indonesia. Qualitative data was collected through field observation and in-depth interviews with key informants. The results showed that the population in the three villages dominated on productive ages, worked as farmers, and less educated (only a half of the population had fulfilled the basic education standard of Indonesia). The study results also indicated that the social capital in the communities showed minimum condition of interpersonal attachment and cooperation. This condition was derived from the attitude of the people who only took personal benefit without concerning to others' welfare. Many programs conducted by government to ensure the conservation of mangroves were project-oriented with minor participation of community. The minor participation might also contributed to the minimum of social capital in the community. To improve social capital, the communities should strengthen mutual trust based on mutual benefit to increase members' participation in mangrove activity.

Key Words: collective action, cooperation, individual characteristic, networks, trust

Introduction

Indonesia is the world's largest archipelago consisting of more than 17,000 islands with the overall coastline length of 95,181 km (Kusmana 2013). In coastal areas, mangrove is one of the ecosystems that serve an important role in providing a broad range of services including soil formation, nutrient cycling, fish spawning, ecotourism, wood production, and carbon storage which contribute significantly to the livelihoods, well-being and security of coastal communities (UNEP 2014). Indonesia has the largest mangroves area in the world (ITTO 2012). However, the areas are likely to decline in both quality and quantity mainly due to aquaculture development (Giri et al. 2008). In 1980, Indonesia had 4.2 million ha of mangrove forests (FAO 2010). The mangrove forest cover had declined about 26%, to an estimated 3,112,989 ha in 2010, or 22.6% of the global mangrove area (Giri et al. 2011).

The community as the main actor in sustainable mangrove management is needed to conserve mangroves and prevent further decrease of the mangrove areas. Realizing the importance of community in managing mangroves, one

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of The Indonesia National Strategy of Mangrove Management promotes a community-based mangrove management (CBMM) conducted to the sustainability of ecology, economy, and social culture, to increase community income and propelling sustainability development (National Mangrove Working Group 2013). The CBMM promotes active involvement of the member of communities in accomplishing all phases of the vital activities such as resource identification, priority development, program design, choice and adaptation of appropriate technologies for formulating and implementing sustainable management practices (Datta et al. 2012).

Some studies related to CBMM recommend that sustainable mangrove forest management needs the supporting of sustainability in the development of social-political, economic, and environment sounds simultaneously. It should be run by the proper institutional and regulations (Kusmana 2015; Datta et al. 2012), stakeholder interaction, trust building and cooperation between and within communities for success (Bizikova et al. 2011). Those components were suggested to study known as social capital.

Social capital in forest management is a relatively new concept as Nath et al. (2010). The social capital in CBMM is as important as natural, economic, and human resources since it gives a contribution to both individuals and communities wellbeing (Coleman 1988). To achieve living improvement and to fulfill the needs, every individual in the social system should interact with each other. This interaction reflected the perceptions of nature, attitudes and actions towards the environment.

Since the CBMM requires active participation from members of the local community to achieve collective goals, the question is how the individual characteristics and the elements of social capital can promote a sustainable community-based mangrove management. The answer can use to develop a suitable design of social capital reinforcement to promote a sustainable CBMM. In this context, the objective of the study is to determine the comprehensive pictures of the individual characteristics regarding economic, social, and cultural aspects hence the potencials, strengths, and weaknesses of the community can be determined. This study also intends to identify the elements of social capital hence a suitable design of social capital reinforcement can be proposed to promote a sustainable CBMM.

Scholars defined social capital as trust (Coleman 1988; Putnam 1995; Fukuyama 1999; Ostrom 2005), norms (Putnam 1995; Narayan and Pritchett 1999; Ostrom 2005), and networks (Bourdieu 1986; Coleman 1988; Putnam 1995; Fukuyama 1999; Lin 2001). Therefore, Pretty (2003) stated that as long as people have managed natural resources, they have engaged in forms of collective action. According to that, this study considers analyzing collective action and cooperation as one component of social capital. Hence, the appropriate assessment tool of social capital here is from the World Bank with six elements. It includes: (1) groups and networks, (2) trust and solidarity, (3) collective action and cooperation, (4) information and communication, (5) social cohesion and inclusion, and also (6) empowerment and political action (Grootaert et al. 2004; Dudwick et al. 2006; Jones and Woolcock 2007). The six social capital elements used to examine and to find out the different types of networking and organizations that could help and hint accesses to the mangrove and the participation in sharing capacity for collective action among groups. To determine the level of social capital in the community, measuring and comparing the six elements was conducted with the grade levels of social capital established by Uphoff (1999).

Materials and Methods

The study area

According to data from Marine and Fisheries Agency of Lampung Province (2010), Lampung Province has mangrove areas of 93,919.72 ha; 34% managed by private companies, 34% led by National Park, and 32% managed by coastal communities. East Lampung Regency has the largest area (18,822.97 ha or 63%) that managed by communities. Based on that, the study areas took place in 2 villages in East Lampung Regency and one village in Pesawaran Regency. These sites were selected based on the ecological condition of its mangrove forest. Margasari Village is located in East Lampung Regency. The mangrove forest in this village is the largest mangrove area in East Lampung (Putra et al. 2015), therefore the communities are very concern about mangrove conservation. In 2006, Margasari Village was selected as the location of environmental education, conservation and community development under the

Decree of East Lampung Regency. Muara Gading Mas Village was in East Lampung Regency too. In contrast to Margasari, the mangrove area in Muara Gading Mas is the smallest area in East Lampung (Putra et al. 2015) and the mangrove forest condition in this village is heavily destroyed. Sidodadi Village has good mangrove forest ecosystems that located in Pesawaran Regency. The village has a unique characteristic of coastal site. It happened since it extended to the upper course of Wan Abdul Rahman Forest Park to the downriver area located around mangrove forest. The location of Sidodadi is about 20 km from the capital city of Lampung Province and directly adjacent to Lampung Bay; different with Margasari and Muara Gading Mas that has a location of 100.3 km from the capital city. The study area is in Fig. 1.

Data collection

The study was carried out on June to December 2015. The data of CBMM groups were collected from preliminary observation to get general picture of the communities in the research sites. The preliminary study revealed that there are five groups of CBMM. Those include Fisherman Community for Mangrove Forest Care (*Kelompok Petani Nelayan Peduli Mangrove*/PAPELING) and Environmental Conservationist (*Pelestari Lingkungan Hidup*) and Margajaya Group and Panca Usaha and Mangrove Conservationist Group (Petani Tambak Pelindung Mangrove/PTPM). PAPELING is in Sidodadi village while the other two groups are in Margasari and Muara Gading Mas Villages.

The primary data collected were including

1. Individuals (respondents) characteristics: age, formal education, non-formal education, level of income, land area and length of stay.

2. Social capital elements: (1) networking and organization, (2) trust and solidarity, (3) collective action and cooperation, (4) information and communication, (5) inclusion and social cohesion, (6) empowerment and political action. The data requirement for identification of the elements of social capital is in Table 1.

The secondary data consisting of descriptions of the research location, statistical data, description of community and other related literatures that collected through desk study. The primary data collected through field-observation, structured interviews, and in-depth interviews. First, observations were carried out to compare the results of interviews with the reality on the field and they were conducted to triangulate the data gathered from the interview. The observations focused on the implementation and utilization of mangrove management activities; both physical conditions on the field and the process of interaction between groups and individuals that took place in the management and utilization of mangrove.

Second, the structured interview conducted for all members of CBMM groups in three villages to collect the primary data. Total 132 respondents consisted of 33 respondents from PAPELING, 24 respondents from PLH, 20 respondents from Margajaya, 10 respondents from PU and 45 respondents from PTPM.

Third, in-depth interviews carried out to the selected re-

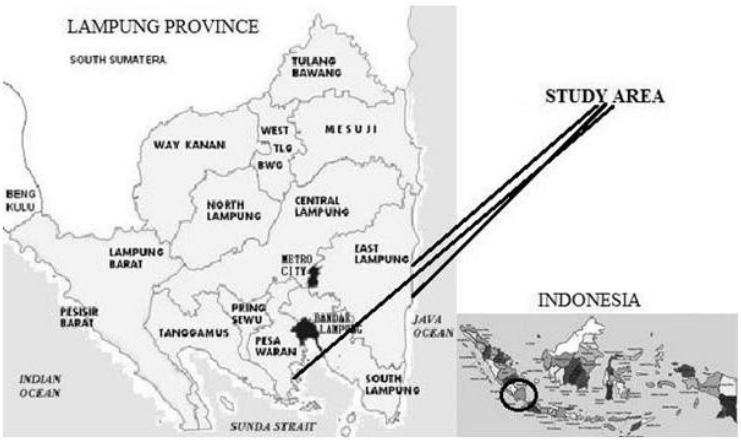

Fig. 1. Study area of Lampung Province, Indonesia.

Table 1. The data requirement for identification of the elements of social capital

No.	Elements of social capital	Data
1	Network and organization	Availability and accessibility of mangrove product
		Access to groups and network
2	Trust and solidarity	The extent to which people feel they can rely on others people
3	Collective action and cooperation	The extent of collective action
		The extent of willingness to cooperate and participate in collective actions
4	Information and communication	Sources of information
		Means of communication
5	Inclusion and social cohesion	Include or exclude members from participation
		The extent and trend of conflict
		The extent to resolve conflict
6	Empowerment and political action	The sense of satisfaction
		The ability to make decisions that affect everyday activities and may change the course of one's life
		Capacity of group members to influence both local event and broader political outcome

spondents by using the question guidelines. The respondents selected through *snowball-sampling* method. These in-depth interviews were intended to explore the qualitative of primary data.

Data analysis

The collected data were analyzed using descriptive and qualitative analysis through cross-tabulated separately against individual characteristic and six elements of social capital. The description of six social capital elements used to examine the level of social capital. The level of social capital compared with the grade levels established by Uphoff (1999). The grades levels were divided into minimum, elementary, substantial and maximum categories as shown in Table 2.

Results

Individual characteristic

The individual characteristics of the CBMM group members in the three villages are shown in Table 3. The results revealed that Sidodadi has the highest percentage of female member (42%) compared to the other two villages. This condition is due to the group's activities for the nursery which required women's ability such as mangrove plantation, preparing planting medium, and maintaining seedling demand. Women are believed to have more patience than men in taking care of those activities in Sidodadi.

In Margasari and Muara Gading Mas, the groups have not mangrove nursery; that's why its groups were dominated by male members.

The average income obtained from mangrove and non-mangrove sectors in the three villages was IDR 1,586,386 or USD 122.03 per month/household. According to Province Minimum Wages of Lampung Province (*Upah Minimum Propinsi*/UMP) in 2015, the respondent's income was sufficient to fulfill their basic need. Their income was almost same with UMP in Lampung (IDR 1.581.000 or USD 121.62 per month/ household) (Statistics of Lampung Province 2015). The average income from mangrove was IDR 157,480 or USD 12.11 per month/ household (10%). It derived from compensation as labor at the mangrove nursery group, the income from the production of shrimp paste and the processing of mangrove leaves and fruit (into chips, crackers, and syrup) has been the main livelihood of the members. The average non-mangrove income IDR 1,428,906 or USD 109.92 per month/ household (90%). It derived from agricultural and fishery activities, services, and salaried jobs.

Social capital

Group and network

Groups and networks enable people to access the resources and collaborate to achieve common goals (Table 4 and Table 5). The communities in the three villages are allowed to utilize non-timber forest products, but the har-

Table 2. The social capital continuum (Uphoff 1999)

Characteristic	Minimum social capital	Elementary social capital	Substantial social capital	Maximum social capital
Commitment to welfare	No interest in others' welfare; seek self-interest maximization at others' expense	Interest primarily in own welfare; cooperation occurs only to the extent that it serves one's own advantage	Commitment to common enterprises; cooperation occurs to a greater extent when it is beneficial also for others	Commitment to others' welfare; cooperation is not limited to seeking one's own advantage; concern for public good
Values	*Self-aggrandizement* respected	*Efficiency* of cooperation	*Effectiveness* of cooperation	*Altruism* regarded as something good in itself
Issues	*Selfishness*-how can this be kept from being socially quite destructive?	*Transaction costs*-how can these be reduced to increase people's respective net benefits?	*Collective action*-how can cooperation (that is, pooling of resources) succeed and be sustained?	*Self-sacrifice*-how far should this be taken: for example, patrioquitetism? religious zealotry?
Strategy	Autonomy	Tactical cooperation	Strategic cooperation	Merger or submergence of individual interests
Mutual benefits	Not considered	Instrumental	Institutionalized	Transcendent
Options	*Exit* whenever dissatisfied	*Voice*, try to improve terms of exchange	*Voice*, try to improve overall productivity	*Loyalty*; acceptance of results if good for all in total
Game theory	*Zero-sum*; but if competition is unconstrained, choices will have negative sum results	*Zero-sum*; Exchanges that are intended to maximize own benefits can have positive-sum results	*Positive-sum*; aim is to maximize own and others' interests to mutual advantage	*Positive-sum*; aim is to maximize common interests with own interests subordinated
Utility functions	*Interdependent*, with weight given only to own utilities	*Independent*, with own utilities being advanced through cooperation	Positively *interdependent* with some weight given to others' benefit	Positively *interdependent*, with more weight assigned to others' benefits than to one's own benefits

Table 3. Individual characteristic of group members in the three villages

Individual characteristic	Village		
	Sidodadi	Margasari	Muara gading mas
Average age (year)	44	48	42
Sex (person)			
Male	19 (58%)	37 (80%)	17 (100%)
Female	14 (42%)	9 (20%)	0 (0%)
Religion	Islam (100%)	Islam (100%)	Islam (100%)
Formal education (person)			
Elementary school	14 (42%)	18 (39%)	9 (53%)
Junior high school	6 (18%)	16 (35%)	8 (47%)
Senior high school	11 (33%)	10 (22%)	0 (0%)
College/university degree	2 (6%)	2 (4%)	0 (0%)
Non formal education (frequency/year)			
0 (never)	15 (45%)	19 (41%)	5 (29%)
1-3 times	8 (24%)	13 (28%)	5 (29%)
> 3 times	10 (30%)	14 (30%)	7 (41%)
Marital status (person)			
Married	32 (97%)	46 (100%)	17 (100%)
Divorced	1 (3%)	0 (0%)	0 (0%)
Residence status (person)			
Native	19 (58%)	30 (65%)	2 (12%)
Migrants	14 (42%)	16 (35%)	15 (88%)
Land ownership (ha/household)	1 (100%)	1 (100%)	1 (100%)
Household income (IDR/Month)			
Mangrove	427,876 (25%)	44,565 (3%)	0 (0%)
Non mangrove	1,266,667 (75%)	1,596,522 (97%)	1,423,529 (100%)
Number of household worker (person/household)	2	2	2
Household size (person/household)	5	5	5
Sick occurrence (case/year)			
0 sick/year	23 (70%)	46 (100%)	16 (94%)
1-3 times of sick/year	10 (30%)	0 (0%)	0 (0%)
> 3 times sick/year	0 (0%)	0 (0%)	1 (6%)
Average of residence time (person/year)	32 (100%)	28 (100%)	24 (100%)
Tribe (person)			
Javanese	16 (48%)	45 (98%)	17 (100%)
Sundanese	3 (9%)	1 (2%)	0 (0%)
Celebes	14 (42%)	0 (0%)	0 (0%)
Distances between home and mangrove (km)	0.5	0.9	0.8

vesting of timber from the mangroves is prohibited. Non-timber forest products are important component of subsistence and livelihood of communities living in and surrounding the forests (Sharma et al. 2015). However, the utilization of the non-timber forest products was not optimally performed by the communities in the three villages. For example, previous study in Margasari Village revealed that the value of the direct use of non-timber forest products from mangroves was only 18% of the total economic value (Ariftia et al. 2014). Furthermore, there was less active cooperation within groups to explore the mangrove since the utilization of mangrove has done individually.

Currently, in the three villages, the mangrove group activities such as meetings and other events are infrequently held. As a result, many members are less recognized as a member of the group since they are not getting involved in

Table 4. Accessibility to mangrove activity (√ =allowed to access; × =prohibited to access)

Activity	Village				
	Sidodadi	Margasari		Muara Gading Mas	
	PAPELING	PLH	Margajaya	PTPM	PU
Nursery	√	√	√	×	×
Planting	√	√	√	√	√
Wood utilization	×	×	×	×	×
Non wood utilization	√	×	×	×	×

Table 5. Memberships and networks characteristics of mangrove groups in the three villages

Characteristic	Village				
	Sidodadi	Margasari		Muaragading mas	
	PAPELING	PLH	Margajaya	PTPM	PU
The way to become a member (%)					
Own desire	55	0	50	36	0
Asked to join	45	100	50	64	100
Heredity	0	0	0	0	0
Period of membership (year)	6	15	13	1	4
Number of organization membership (%)					
0	85	0	50	79	67
1-3 organizations	12	100	50	14	33
＞3 organizations	3	0	0	7	0
Number of organization membership outside village (%)					
0	36	88	83	100	67
1-3 organization(s)	58	13	17	0	33
＞3 organizations	6	0	0	0	0
Interaction among members (%)					
Daily	12	0	33	0	0
In activity of both inside and outside the organization	24	0	0	43	0
Only in their organization activity	64	100	67	56	100
Interaction with members of other group (%)					
Always	27	63	50	0	0
Sometime	21	25	17	14	33
Never	52	13	33	86	67

meetings or other group activities. Formerly, the meeting was regularly scheduled to discuss the group programs in managing mangrove. But, nowadays, these activities were also done without any group meetings.

In Margasari and Sidodadi, many mangrove conservation activities held by other parties such as university, local governments, or non-government organizations (NGOs). However, the activities were only involved the chairmans and administrators of the community groups without active participation from other group members. In Muara Gading Mas, the conservation activities commonly involved all groups members. The conservation activities in the three villages such as mangrove plantations generally initiated by university, government agency, or NGOs, while the three villages commonly acted as the program executor. In Sidodadi and Margasari, the nursery activities were conducted only based on demand of mangrove seedlings; otherwise the group will hold neither any meetings nor other

group activity. Nursery activities were not conducted in Muara Gading Mas, only mangrove plantation was conducted.

Trust and solidarity

Trust is commonly associated with solidarity. The solidarity in mangrove management group appears because of the sense of togetherness, unity of interest, and sympathy among groups. According to the Table 3, all group members in the three villages are Moslems. The members of groups with the same religion can share values that recognized and believed together based on their religious norms. It will strengthen the trust in the group, but it may also weaken the social capital when the religious views indirectly restrict the flexibility of group members to work with the communities with different religions outside the group.

The results revealed that the trust between society members in three villages become less reliable. Although all members have the same religion, the openness within the community committed to low. According to respondents in the three villages, it was not all members of the group can be trusted. The number of close friends who can be trusted as a place of complaining about problems and willing to help in urgent situations, including funding needs is only 2-4 people in the group.

Solidarity between people can be seen from a sense of belonging among members (Cahyono 2012). The intense harmony and the unity of society can be seen from the tradition of visiting friends or relatives (*silahturahmi*), the exchange of information, experiences and togetherness. The early period of group establishment showed strong solidarity and togetherness among group member. It can be seen from the rehabilitation of the damaged mangrove initiated by the group in the past has succesfully increased the current mangrove area. However, nowadays, the interaction among members in mangrove activities rarely done because the intensity of a group meeting in the three villages declined. Consequently, the solidarity fell reflected from less togetherness in mangrove activity, unity of interest, and sympathy among groups.

Collective action and cooperation

Social capital can increase mutual awareness of some possible opportunities that could be exploited, while the collective action activity can be an effective way to achieve the community welfare. Collective action and cooperative are reflected from how a member deal with other members in group activities or in giving respond to the existing problems or crises.

In 2002, PAPELING initiated the collective action of mangroves plantation in Sidodadi. The program was intensively discussed through religious meetings that regularly held every month in the village. The chairman of PAPELING who is also the religious figure and the chief of village has a very important role to bring awareness to the society about the importance and the conservation of mangroves. Hasbullah (2006) stated that every social entity own a figure that could be a role model in behavior. The program was succesfully rehabilitated mangrove areas that were previously converted into shrimp ponds and increased the mangrove areas to 75 ha in 2006 (Cindoswari 2008). However, currently, cooperation of the group declined and the mangrove plantation was rarely be done. The latest data showed that the area of mangrove in Sidodadi was decreased to 42.17 ha (Nugraha et al. 2015). It occurred because of some mangrove areas were destroyed by the community and converted into the beach (tourism).

In Margasari, collective action in planting mangroves was held by the community since 1994 after coastal abrasion on a large scale occurred. This disaster resulted in the loss of ponds that belonged to the community and transformed into a sea. The mangroves plantation conducted by the support from the central and regional government. At the moment, the member's faith to cooperate and to participate in a group of mangrove in Margasari has begun to reduce. The mangrove plantation activities mostly have done when there were programs or cooperations from external parties., these activities should involve all members of a community group, but they have not invited, except only the chairman and the administrator of the group instead. Commonly, members and the administrator of the group were participating in mangrove activities to obtain the material, rewards or incentive as the replacement of their work time Similarly, both management and members in Sidodadi and Muara Gading Mas who involved in the activities would have earned money based on their contribution level. This would be an obstacle since the activities that did not provide money or any other material as a reward. This con-

dition is contradicted with the idea pointed by Pranadji (2006), since the sustainability of community empowerment needs not only the provision of material, but also the spirit of collective work and the respect to the common property resources.

Mangrove groups in Muara Gading Mas formed by some government activities of reforestation and mangrove planting. The group's activities rely on government programs. When government did not provide any regular program, the groups did not have any initiation or independent activities. The members willingness to come together and to do collective activities did not appear as an expression of solidarity within the group.

The traditions such as planting mangrove every month by local communities in the three villages that affect to cooperation and collective actions were rarely permormed. Goverment influence has reduced that value in collective action. The government initiative seems to be less effective to make the member of the group active to do some activities due to they could not cooperate with each other. The participation of members in an activity does not arise from personal willingness, but it was more because of the command from chief of group, and there is less punishment for those who does not involve in the group activities.

Information and comunication

Social capital is different from other capitals because social capital has a special function to create and to transfer ideas and thoughts through social mechanisms such as religion, traditions, and habits that were hereditary institutionalized. The organization will be very effective if it is supported by the presence of people who can communicate and share a variety of ideas and the existing ethical values (Hasbullah 2006).

In Sidodadi, there was a group leader who has initiated a further Coastal Village Planning Workshops which held in March 2006 and took place in Sidodadi. This workshop became a forum for the stakeholders to communicate and compose the guideline of integrated coastal village development. Furthermore, intensive communication has been conducted by PAPELING to both group members and external parties such as government, University of Lampung, and NGOs, but currently the communication was less conducted . Whereas information and communication is a central mechanism to help members strengthen their bargaining position in some cases that affect their welfare.

The vertical communications between mangrove groups in Margasari and external parties went effectively with the mediation of Lampung Mangrove Center (LMC). This communication generates cooperation related to mangrove activities. However, horizontal communication (within the administrator and members or among members of the group) did norun well.

Contradictory to Sidodadi and Margasari, communication about mangrove in Muara Gading Mas occurred only among members (horizontal communication). Group's activities that involved external parties were less performed. This condition impacted the member interaction and vertical communication.

In three villages, the informations within group activities has not been evenly disseminated to all members. Commonly, the information was only received by the members of the group through a meeting. However, since the group members rarely come together, sometimes these information was only given by phone calls or text messages. The information received by the members always originate from the chief of the group. The pattern of the information dissemination was remained static. Muspida (2007) stated that through the mutual interaction of individual, the individuals would be interconnected and influence each other. The direct reciprocal interaction would change attitudes and it reflects the dynamic relationship between individuals and organizations.

Social cohesion and inclusion

Cohesion and inclusion are the insistence of social ties and potential capability to include or exclude members of thecommunity (Dudwick et al. 2006; Jones and Woolcock 2007). Cohesion and inclusion can represent a feeling of security in the fulfillment of needs, triggering a conflict within the group and excluding the members from the activities. Social cohesion and inclusion provide personal comfort in joining and interacting in groups. Social cohesion and inclusion in three villages are in Table 6.

In Sidodadi, PAPELING had a high cohesiveness in the group. The interaction among members of the group was not only performed during group meetings but also during religious meetings called *pengajian*. All members of

Table 6. Social cohesion and inclusion characteristics of mangrove groups in the three villages

Characteristic	Village				
	Sidodadi	Margasari		Muara Gading Mas	
	PAPELING	PLH	Margajaya	PTPM	PU
Include and exclude from participation	The exclude happened to female members of PAPELING when the location of mangrove planting is quite distant or inaccessible.	The cooperation with the outside parties often did not involve members even the members did not know about the activities carried out on behalf of the group.	LMC as the center of mangrove activities management has not been involving Margajaya group on various activities related to mangrove management. The cooperation group through LMC was still dominated by PLH.	All members can participate in all mangrove group activity and no exclude.	All members can participate in all mangrove group activity and no exclude.
The extent and trend of conflict	The conflict occurred when external parties who have a land certificate in mangrove area, convert mangrove into coastal tourism.	The conflict occurred between the member of groups and the people outside the group that violates the rules of the group.	The conflict occurred between the member of groups and the people outside the group that violates the rules of the group.	The conflict among members caused by missunderstandings or disagreements during the meeting.	The conflict among members caused by miss understandings or disagreements during the meeting.
The extent to resolve conflict	The conflicts were resolved through mediation and problem discussion between the chief of the group and the parties in conflict with less involvement of members.	The conflicts were resolved through mediation and problem discussion between the chief of the group and the parties in conflict with less involvement of members.	The conflicts were resolved through mediation and problem discussion in group meetings between all groupmembers and the parties in conflict.	The conflicts were resolved through mediation and problem discussion between thechiefofthe groupand the parties in conflict with less involvement of members.	The conflicts were resolved through mediation and problem discussion between the chief of the group and the parties in conflict without involvement of members.

PAPELING were members of the religious meetings. Different with Margasari and Muara Gading Mas, among group's members did not have similarity of membership in any group.

Empowerment and political action

All groups claimed that they have written and unwritten rules. The written rule of PLH group in Margasari was once used as reference or model by other groups. The group administrator in Sidodadi and Margasari had been a guest speaker for the mangrove group in other areas in planting and seedling mangrove activities, but this activity has not involved all members yet. It means that the existence of mangrove groups in Sidodadi and Margasari has been able to give influence to the mangrove groups in other areas. In contrast, the groups in Muara Gading Mas as new groups did not have influence to others groups.

In the three villages, the network capacities of groups eventually were not yet able to exploit the satisfaction of its members. The existence of mangrove group did not affect to the local or region political outcome. Internally, the group's membership has less effect on the family, daily and social activities. The satisfaction of being a member did not appear.

Discussion

Social capital is a pre-requisite for sustainable management and development and natural resources (Pretty 2003) Social capital grows in a group to interact with other as an important part of the inherent value. Nahapiet and Goshal (1998) stated that the individual level, the source of trust derived from the values originated from religious beliefs, the competence of a person and openness within the community that has become the norm in society. Due to the associations between individuals and their organization, Sidodadi has had high cohesion and solidarity that derived from a common religion, strong religious tradition, and mutual experience to face the impact of the destruction of mangroves. However, Sidodadi had the low extent of trust because of the minimum of reciprocal interaction with the values and culture outside. Trust was developed internally within the group. Sidodadi does not have a strong network outside (bridging) so it did not have a significant effort to change (the group's activities only seedling and planting mangrove) and could not bring progress and innovation for group members.

Group network in Sidodadi and Muara Gading Mas existed temporarily and they usually occurred in the context of physical relationship. The elements that had been emphasized both vertically and horizontally between individuals and their organization known as bounding and bridging social capital (Serageldin and Grootaert 1999). Group interaction with external parties (bridging) commonly initiated in the form of short-term activities such as mangrove planting carried out by various parties from the outside of the village. There has been less activity or interaction that is sustainable in the long-term period with the parties outside. This condition was bridging on lack of culture acculturation particular culture which can increase social capital of group members.

The low extent of social capital weakens the spirit of togetherness in managing mangrove and obstruct several promising changes. In Margasari, PLH is considered bridging group which had network with both domestic and international universities, government, local and international NGOs. However, this bridging power did not strengthen the social capital because the cohesiveness which reinforces bonding within the group is weak. The groups in Margasari and Muara Gading Mas which formed by the government and universities need to increase horizontal interaction in the group (bonding) to strengthen the network by community efforts to increase the social capital. The situation happen vice versa in Sidodadi, collective energy in the group should be expanded by building the awareness of the network in vertical interaction. This strategy is not only used to improve the collective energy but also to build a strong commitment to promoting the welfare of others. The cooperation group should not be limited to the personal benefit but also the mutual benefits to rise up the economic, social, and cultural aspect.

The members of the group in three villages are generally in productive age that is the optimal age to perform physical labors such as farmers and fishermen (Skirbekk 2008) so that they will always eager to fulfill the daily needs by all means necessary. As a result, when the pressure of economic need increase, the community will be quickly directed to exploit and cut mangrove and convert it to other uses which

are economically more profitable in short term period.

The group rule has prohibited the community from entering the mangroves area. When ecological systems of mangrove were damaged, this prohibition was suitable to protect mangroves in Margasari. Along with this change, the ecological condition of the mangrove was getting better and the mangrove area increased. However, the state of the people around the mangrove was also changing with the increasing population. The demands of agricultural land and economic needs households were also increased. The existing and static rule became a potential threat since the community surrounding mangrove in Margasari and Muara Gading Mas are poor. The current regulation that do not adjust to the dynamic changes of the social condition can erode the cohesiveness of the group. The people's behavior was difficult to control because the existing rules began to lose their power and strength.

This urgent situation requires how to improve the group rules to accommodate the utilization of mangrove economically without ignoring the ecological sustainability.

The poor formal educational background of the group requires an additional non-formal education. Trede and Whitaker (2000) pointed out that learning and continuing education are important in the development of farmer careers since farmers' education significantly increases the net household income (Panda 2015). Therefore, it is strongly recommended that farmers should be regularly trained by the extension agents. The government should also organize seminars, conferences and workshops on the management and sustainable utilization of mangrove to increase their income (Ibitoye and Onimisi 2013). The sustainability of mangroves can be maintained if the communities surrounding the area are prosperous.

Table 7 shows levels of each element of social capital on the mangrove groups in the three villages. The results showed that the level of social capital of mangrove groups in the three villages could be considered as an elementary social capital. According to Uphoff (1999), the elementary level means that the cooperation in the groups is only for the sake of (and only to the extent of) personal benefits. The results in Table 7 also showed that there is no commitment of collective action. The cooperation occurs when there is a personal benefit can be achieved instead of mutual benefits for others. The participation of members in the group activities was only intended to achieve reward such as the wages in planting and mangrove seedling production. There is no collective action to be applied to gain the successful and the sustainability of resources. This collective action was only apply in small amount in part of seedling and planting activities and the aim was not for collective utilization that organized by the group for increasing the local economy. The activities were a project-oriented in short term period. Even sometimes the activities were carried out personally without involving members of the group. In addition, Lesser (2000) stated that the condition would even worse when reciprocity had undermined and overrides private interests of local groups that could rising the suspicions and mistrust value due to those factors were fueling the potential of the over-utilization of natural resources.

The insignificant growth of mangrove management in

Table 7. Levels of each element of social capital on the mangrove groups in the three villages in accordance to Uphoff (1999)

Characteristic	Village				
	Sidodadi	Margasari		Muara Gading Mas	
	PAPELING	PLH	Margajaya	PTPM	PU
Commitment to welfare	Substantial	Elementary	Substantial	Elementary	Elementary
Values	Elementary	Elementary	Elementary	Elementary	Elementary
Issues	Elementary	Minimum	Elementary	Elementary	Elementary
Strategy	Elementary	Minimum	Elementary	Elementary	Elementary
Mutual benefits	Elementary	Elementary	Elementary	Elementary	Elementary
Options	Elementary	Elementary	Elementary	Elementary	Elementary
Game theory	Substantial	Elementary	Elementary	Elementary	Elementary
Utility functions	Substantial	Elementary	Elementary	Elementary	Elementary

the three villages was caused by the low extent of trust, values of cooperation, and mutual help as a consequence and configuration of values in social system of local communities. Mutual trust in a community is one of the important aspects to strengthen social capital. Trust is a key determinant of the quality of cooperation and participation in communities (Bizikova et al. 2011; Acedo and Gomila 2015). Zulfianarisiandra (2009) pointed out that without trust among group members problem in the group would be difficult to be resolved. Since several threats such as the conversion of mangrove area into tourism place in Sidodadi and the logging in Margasari and Muara Gading Mas need to be immediately addressed, it is necessary to strengthen the institutional groups in the three villages so that collective action and cooperation in the management of mangrove can run continuously. Moreover, the conflict could be handled peacefully if the community could act together and cooperative (Choi et al 2015).

Conclusions and Recommendations

The social capital of mangrove groups in the three villages was at elementary level, showing minimum condition of inter-personal attachment and cooperation. The minimum condition of social capital potentially decelerates sustainable mangrove management. To overcome this condition, the reinforcement of mutual trust in the communities is needed to strengthen a CBMM. The mutual trus should be based on reinforcement of mutual benefit, solidarity, networking, cooperation, sharing information, social cohesion, empowerment, and political action. Mutual trust among group members should be maintained by holding a frequent "meeting" and "interacting" activities to create emotional bonding to drive them to act together and to get more attached to values of belonging. Therefore, mangrove activities should establish the active involvement of all the group members. Furthermore, trust should be based on the common welfare to encourage collective action.

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