LOCAL PEOPLE’S ATTITUDES TOWARDS MANGROVE CONSERVATION EFFORT IN EAST KALIMANTAN, INDONESIA

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ABSTRACT

Background: Human activity has accelerated the degradation of mangrove forests in Southeast Asia, especially in Indonesia. The Government has encouraged conservation efforts towards the woods to cope with this problem. Participation of local people is considered necessary nowadays to understand their attitudes related to such issues. Studies are limited in Indonesia's context, especially in East Kalimantan province's case concerned with a heterogeneous community regarding socioeconomic and limited access to conservation activities.

Aim: This study aims to understand how local people could have different participation and willingness to participate (WTP) as the embodiment of their attitudes towards conservation activities and how their reasons are associated with the heterogenous characteristics by taking the location of Margomulyo Mangrove Conservation Area (MMCA) Balikpapan, East Kalimantan.

Method: This study uses a qualitative approach combining interviews, observation, and document collection methods. The data is analyzed inductively using coding stages from Miles, Huberman, and Saldàña.

Findings: This study reveals positive attitudes by different participation from local people that presented as a heterogeneous community. Reasons for involvement vary and are associated mainly with occupation, experiences in mangrove conservation activities that gave them access to the projects, and good networks among local people. Meanwhile, an excellent social relationship contributes to the WTP of local people in the projects with different preference types of activities. This study’s findings suggest equitable management for local people by the Government by considering adequate social capital that already exists in the community.

KEYWORDS attitudes, local people, heterogeneous, mangrove conservation, East Kalimantan

INTRODUCTION

Mangrove forests are the world's most productive ecosystems and play a significant role as place with rich biodiversity value (Damastuti et al., 2022), carbon absorbent (Cummings & Shah, 2018; Sandilyan & Kathiresan, 2012) as promoted nowadays in many international agendas of climate change mitigation (i.e., UN Ocean Conference 2022), resources for human livelihood (aquaculture, agriculture, and other local subsistence use) (Friess et al., 2019), and spot for ecotourism development (Das & Chatterjee, 2015; Jitpakdee & Thapa, 2012). Yet, those roles simultaneously intertwined with the rapid degradation as the leading worldwide issue for the last few decades. Mangroves in Southeast Asia are the most threatened since the loss is more than 50% for the last record (Feller et al., 2017; Friess et al., 2019; Giri et al., 2011). The main cause of degradation has been engaged by human activities (Romañach et al., 2018), such as settlement and aquaculture (Cummings & Shah, 2018; Gandhi & Jones, 2019). Among countries, Indonesia has the most extensive mangrove area loss (3.11%), substantially

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more than double the global average. This country had recorded a historical piece of immense mangrove loss due to aquaculture activities (shrimp and fish ponds) in the late 1990s to 2000s which was located in East Kalimantan.

Local people’s participation became a challenge to conservation activities' success and got scholars' worldwide attention (Bennett & Dearden, 2014; Roy, 2014; Triyanti et al., 2017). Participation understands their positive or negative attitudes toward the conservation efforts from the perception and experience (Badola et al., 2012). However, few of the studies focused on the local people's participation by taking into account the heterogeneity of society and limited access to the activities under the government's management (Armitage, 2002; Bennett & Dearden, 2014; Lamsal et al., 2015; Simarmata, 2012).

This study emphasizes the abovementioned conditions, focusing on the local people surrounding Margomulyo Mangrove Conservation Area (MMCA) in Balikpapan, East Kalimantan, Indonesia. Although the forest area is less significant than other areas (around 40 hectares), it differs considerably from other East Kalimantan and Indonesia mangrove areas. This site belongs to the local Government of Balikpapan, which frequently becomes a spot for multiscale planting projects (international, national, and local). Besides, this area was chosen as a pilot site for the project called Mangrove Ecosystem Conservation and Sustainable Use in the ASEAN Region (MECS) by the Ministry of Forestry cooperates with Japan International Cooperation Agency (JICA) as support towards sustainable development principal through conservation projects at the beginning of its establishment.

As the status of the forest under conservation policies managed by the Environmental Agency of Balikpapan City (Dinas Lingkungan Hidup/DLH) with such projects, local people living adjacent to this area, particularly those depending on their livelihood in this area, no longer have access. Despite prohibition through regulation, DLH involves local people to participate in conservation. Yet, the recent management apparently limits the access to participate. At the same time, as the expansion area for settlement, Margomulyo is characterized as an area occupied by migrants. Thus, besides linking livelihood to conservation, the integration dynamics for supporting the projects became crucial (Arnez, 2017).

Therefore, this study was conducted to understand the different participation and willingness to participate (WTP) in planting projects and the reasons for their participation or WTP. The researcher attempted to unravel local people’s participation in mangrove conservation activities, their reason to participate in the activities, their way to exhibit their WTP in mangrove conservation activities, and the reason they WTP in mangrove conservation activities. This information can be useful for policymakers and practitioners who are interested in promoting community participation in environmental conservation activities.

METHOD

This study used a qualitative approach that embedded a case study. Interviews were held with 98 local people who lived in four household associations (Rukun Tetangga/RT), called RT 14, RT 40, RT 41, and RT 42 in Margomulyo suburban village (kelurahan), well-known as locations surrounding MMCA. In-depth interviews were conducted with local people considering their socioeconomic characteristics (age, occupation, income, education, and ethnicity). In addition, three elites from DLH Balikpapan, two from Margomulyo Suburban Village (kelurahan), and four heads of household associations (rukun tetangga/RT)
surrounding MMCA were interviewed, respectively. Conservation activities and social dynamics of local people were likewise observed. In addition, collecting documents regarding conservation (media news, documents of DLH Balikpapan, etc.) completed the method used in this study. The data from the interviews transcript was conducted by using Atlas.ti qualitative research software.

The inductive fashion approach (Miles et al., 2014) was used through a coding process (first cycle coding by using descriptive coding and attribute coding), then generated theme: participation and WTP (second coding by using pattern coding). The characteristics of interviewees were coded through attribute coding. Specifically, income characteristics were categorized as middle and low income, and ethnicity characteristics were categorized as Javanese and Buginese people as the dominant ethnics settling near MMCA.

RESULTS AND DISCUSSION

Local People's Participation in Mangrove Conservation Activities

Participation in planting projects revealed differences among local people based on their perceptions of current management and experience of planting projects. Of current management, DLH Balikpapan, the owner of the forest land and manager of the MMCA, implemented inclusive management by involving third parties in funding planting projects in MMCA. Irrespective of inclusivity, this management strategy made local people no longer involved in many planting projects as perceived by most of them. Yet, they still have access to the projects through one local mangrove group that became a partner for the DLH, namely "Tepian Manunggal Abadi." According to the leader of this group, the mangrove group has legal form from the previous name, "Tepian Lestari" to follow the procedure and have legal rights to perform the projects.

Furthermore, the membership structure likewise changed and involved a limited number of participants. This group was the primary entity at the community level and undertook the mangrove planting projects in MMCA in four types of activities; nurseries, planting, maintenance, and supervision. Interviews with member groups and key informants of heads of households showed that men did those activities.

Therefore, there were two categories of participation perceived by local people by such conditions. First, those who showed their participation by emphasizing their status as a member of "Tepian Manunggal Abadi." Second, those who expressed their participation through experiences in previous planting projects either as a member or non-members of the former mangrove group. The analysis then differentiated them into participation through membership of the mangrove group and outside of the mangrove group by means of participation experiences.

Participation as Mangrove Group Members

Few interviewees (four persons) expressed participation as members of the "Tepian Manunggal Abadi" group compared to participation outside of mangrove group members. They consisted of a leader, a treasurer, and two other members. Based on analysis from interviews of members, the way they recruited differed from others. Despite most of them being related to mangrove forests (fishermen), their memberships were generally associated with
social networks in terms of social relationships with the DLH officials, in particular the leader, and among members themselves.

This condition differed when local people participated in the beginning of MMCA management. The mangrove forest in Margomulyo was officially enacted by the name MMCA as an urban forest and for conservation purposes through the Mayor Decree of Balikpapan City No. 188.45-155 in 2004. The consideration of such regulation was based on the Government's regulations at the national and regional level, including obeying the countries' agreement toward United Nations Biodiversity 1992 regarding, in particular, protection and conservation efforts towards the threatened areas where Indonesia took part. DLH Balikpapan had full authority over the area and emphasized protection status since the forest was damaged by shrimp pond activity. There were 20 ha areas for conservation of the total 40 ha mangrove forest area. Local people no longer have the right to access mangrove resources because of this status. An elite from DLH has an explanation for why the mangrove forest in Margomulyo was prohibited from accessing: "The first point is actually to secure [the remaining forest] so that in this city, there are still urban forests. Step by step, the Government acquired [the land] around Margomulyo [mangrove forest]. In the past, the area was ponds belonged to local people."

However, local people's role through participation in conservation efforts was indeed an essential chapter in all regulations regarding conservation. Thus, as mangrove planting continued, their access to planting projects has no alteration, either as members or non-members of the group of "Tepian Lestari." They undertook planting projects under the supervision of this institution. Based on interviews with one fisherman who was also a member of the group, more than 50 members from four RTs. In addition, most local people from four RTs outside the group participated in planting activity when they were invited. They were all considered volunteers even though they got paid for their participation.

Until 2014, the DLH changed the management strategy of MMCA from thoroughly government-supported mangrove planting projects to mangrove planting projects in the form of corporate social responsibility (CSR) program. When the officials of DLH explained about this strategy, they strongly highlighted the budget issue. Thus, they allowed the third parties to take part in the projects. As an official of DLH Balikpapan stated: "We faced a budget deficit in the development of the city forests. That is why we asked for support through CSR. One of them is for Margomulyo".

Based on the Peatland and Mangrove Restoration Agency of the Republic of Indonesia 2022 document report, CSR was one of the funding schemes to support the acceleration of mangrove rehabilitation. During fieldwork, it was observed that planting projects in MMCA have devolved to local people cooperating with third parties (e.g., public/private companies). The largest project, for instance, group members, executed the CSR program of the state-owned oil company, TBBM PERTAMINA Balikpapan. According to the treasurer of the mangrove group, there were 10000 mangrove seedlings to be planted during the period 2016-2020 with a total budget of roughly 132 million Rupiahs (8819.82 USD). The first planting of 2000 mangrove seedlings was in the area of 1 hectare in MMCA.

This project was the starting point a requirement of the legal status of the mangrove group for accountability purposes which further impacted local people to participate in terms of limited access. This procedure likewise became the reason for proceeding with the group's existence with lawfulness. At the same time, it was tough for local people to establish a new
group unless joining the existing one. The former mangrove group "Tepian Lestari" was changed to "Tepian Manunggal Abadi" and the name obtained its legality in 2018 under a decree of the Ministry of Law and Human Rights Indonesia. While they administered the legality, they kept handling the ongoing projects. There have been many contracts for planting schemes in MMCA that the members of the mangrove group have undertaken. Still, the projects mainly did not involve individuals outside the group. The memberships of the current group were much reduced (6 people). Margomulyo possessed only this mangrove group collaborating with other stakeholders in planting projects. Based on interviews with the treasurer of the mangrove group and DLH officials, the group performed nurseries, planting, maintenance, and supervision once the projects got permission from DLH. As stakeholders, mangrove group, DLH, and PERTAMINA, in particular, directly coordinate the projects (figure 1).

Figure 1. Mangrove Group Position in the Management of MMCA by DLH Balikpapan through CSR Strategy and the Activities
*Source: Author*

The support from *DLH Balikpapan* to this group to undertake the planting project funded by PERTAMINA was told by an interviewee who also a member of the group: "The mangrove group now is national level (legality). So, if there are planting projects, we are legal. The DLH believes us 100%. When there was a planting project [PERTAMINA project], we were supposed to have legal standing because the budget was huge. However, DLH claimed if they want to use outer people, it is better to pending it unless we [mangrove group members] execute the project. Outer people do not know the nature factor there [MMCA]". (Mangrove group member, Buginese, 55 years, fisherman).

This view was echoed by the interviewee, who has status as the mangrove group leader. However, as a newly formed group, their memberships were limited in number: "...We don't have legality (Tepian Lestari group) ...In 2018, the group name was changed become Tepian Manunggal Abadi [after legalization] and had six [official] members." (Mangrove group leader, Javanese, 40 years old, fisherman).

Moreover, as mentioned by the mangrove group leader, the limitation regarding group members was similar to the legal document of "Tepian Manunggal Abadi" group. He added...
that the group could not accommodate all local people to be official members. However, in the case of big planting projects that need laborers, they sometimes involve relatives to participate. Similarly, DLH Balikpapan officials justified that at the time the procedure became more stringent (i.e., mangrove group legality), they approached merely the guardian of MMCA and a few key people experienced in conservation before, such as a former leader of the mangrove group who was also a fisherman. At least two reasons appeared based on their explanations. First, the number of officials who work in the field and interact with local people was limited. Second, local people within a mangrove group that had existed were already sufficient to support DLH Balikpapan’s mangrove conservation programs. It was because members of the "Tepian Manunggal Abadi" were generally members of the former group.

Socioeconomic Characteristics of the Mangrove Group Members

As mentioned above, few local people participated as members group (four of the 98 interviewees). The socioeconomic background of members represented a mix of different ages, occupations, income levels, education levels, and ethnicities (Table 1).

Table 1. Local People Participated as Group Members and Socioeconomic Characteristics

<table>
<thead>
<tr>
<th>Informant</th>
<th>Age (Year)</th>
<th>Occupation</th>
<th>Income level</th>
<th>Education</th>
<th>Ethnicity</th>
<th>Inhabitation</th>
<th>Participate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informant 2 Javanese</td>
<td>40</td>
<td>Fisherman, MMCA guardian</td>
<td>Middle-income</td>
<td>Senior high school</td>
<td>Javanese</td>
<td>RT 42</td>
<td>Participated as a leader</td>
</tr>
<tr>
<td>Informant 3 Buginese</td>
<td>55</td>
<td>Fisherman</td>
<td>Middle-income</td>
<td>Primary school</td>
<td>Buginese</td>
<td>RT 41</td>
<td>Participated as a treasurer</td>
</tr>
<tr>
<td>Informant 17 Buginese</td>
<td>59</td>
<td>Fisherman</td>
<td>Middle-income</td>
<td>Junior high school</td>
<td>Buginese</td>
<td>RT 41</td>
<td>Participated as a member</td>
</tr>
<tr>
<td>Informant 18 Buginese</td>
<td>37</td>
<td>Laborer</td>
<td>Low-income</td>
<td>Primary school</td>
<td>Buginese</td>
<td>RT 41</td>
<td>Participated as a member</td>
</tr>
</tbody>
</table>

*Source: Author*

Local people joining as member group were productive age, ranging from the youngest (37 years old) to the oldest (59 years old). Regarding the diversity of membership within the group in economic background, findings showed that although members were mainly identified as fishermen, another member had a different occupation as a laborer. They came from middle-income and low-income levels, with the highest income of 5 million Rupiahs and low income of lower than 1 million Rupiahs. The members' social background varies, such as education from primary to senior high school. In general, they have a lower level of education. Group members also covered different ethnic backgrounds, Javanese and Buginese. The members' settlement was also scattered at RT 42, where MMCA was administratively located, and RT 41, which was well-known as a fishermen's residential.
The leader was a Javanese fisherman, a middle-income individual who earned money from more than one occupation and had a higher education background level than the other members. The leader admitted that he did not join the former group where most fishermen from four RTs were members, including members in a recent group. Similarly, the former group was initiated and led by a Javanese fisherman. Regarding this position, there was a relation with his occupation as a guardian of MMCA. It also made his social status different from other members and gave him more access to the forest. The procedure of the mangrove group leader election showed the direct involvement of DLH officials. They advocated for him to lead the mangrove group, as he stated: "The DLH officials elected me. I am also taking care of this area (MMCA). DLH hires me before joining the group. This group is actually a self-subsistent group initiated by one person [a Javanese fisherman]."

The leader selection process was related to the group's legalized status, which DLH officials supported. The treasurer of the mangrove group argued about DLH officials' contribution to the legality of the group. He said: "DLH officials directly chose the leader at that time. We agreed. ...This mangrove group's legality finally is national level." (Informant 3 Buginese, 55 years old, fisherman, treasurer of mangrove group). In addition, his house was the nearest to the entrance of MMCA at RT 42. It was also one of the reasons why DLH officials hired him as the guardian of MMCA.

Meanwhile, the treasurer was a middle-income Buginese fisherman with the lowest level of education. Nevertheless, his background as a fisherman who participated as a mangrove group member since the beginning made him knowledgeable and skilled in conserving mangrove forests. It was reasonable since he inhabited RT 41, where the first mangrove group was established. His involvement in the group was based on good relationships with officials of DLH.

The other two interviewees who expressed their participation as group members did not have an elite position in the group (ordinary members). Informant 17 of Buginese, 59 years old, has occupation as a fisherman and was in a middle-income category. Like the treasurer, he participated since the beginning of conservation initiated by fishermen in RT 41, where he also resided. Meanwhile, informant 18 Buginese, 37 years old, has a different occupation, as a laborer and graduated from primary school. Like other Buginese members, he lived at RT 41, where most Buginese people lived. He admitted that his involvement in this group was related to the close relationship with other fishermen, as the group's treasurer explained.

All members admitted that they did their main occupation while they were mangrove group members since they could not rely on enough income benefits from the projects. Across all characteristics, occupation (fisherman), education (low level of education), and ethnicity (good relationships) are associated with memberships of the group.

**Reason for Participation in Mangrove Conservation Activities (Mangrove Group Member)**

The reason that drove members to participate in planting projects under Government's management were identified and explained in answering question 2. They expressed more than one reason and differed in their participation. In addition, the interaction between these reasons and the benefits they got were likely to exist and drove an attitude committed to mangrove group-based conservation. Their primary considerations were interrelated to their occupational
backgrounds, experiences in conservation activities, and relations with the members of the group (bonding networks) and the government officials (linking network).

The mangrove group leader stated his involvement in the projects was related to his job as MMCA guardian, where the DLH paid him monthly for this job. The statement "conservation area guardian" showed that this occupation, at the same time, enhanced his social status as the leader of the mangrove group due to his strong connection (networks) to the officials of DLH, which drove the responsibility to participate.

Two other members (treasurer and Buginese fisherman member) similarly admitted that they have awareness toward mangrove forests since their involvement in conservation activities before this area was under government management. They joined the former group initiated by a Javanese fisherman. Their background occupation as a fisherman directly attached to the mangrove forest prompted their awareness. Interviews with one of the members showed: "I have been a member of mangrove conservation group since 2000 and have been active until now. The active member around six people, and others only when they have time. I want to join (the activities) because it is part of my awareness and my responsibility as the locals settle in here. If it is not so, our forest will be lost" (interviews, informant 3 Buginese, fisherman).

Meanwhile, labor Buginese members admitted differently that he participated, besides he could get side income from the projects. He joined because the treasurer recruited him since they have good relations as relatives. Their participation received the benefits of income as well. They allocated payment for each activity instead of volunteering as their activities required labor power for a long time. Regarding this issue, the elite of DLH Balikpapan said: "If the orientation is a project, they (local people) will face difficulty (to expect payment). Conservation, so far, is supposed to have a willingness to pay for supporting the protection of mangroves. We cannot allocate money for payment. That is why we rely on CSR."

Based on observation, their participation was intertwined with social dynamics as a heterogeneous society. For those reasons, it can be said that occupation related to mangroves forest and experiences in planting projects was generally associated with the reasons for participation. Those two factors likewise related to the networks with DLH officials that gave them access to conservation management. Ethnic-based good relationships were likewise associated with the reasons to participate, even though it was not prominent.

**Type of Activities in Planting Project**

The type of activities among members of the mangrove group differed, notwithstanding they had access to the activities. As mentioned before, conservation in this study refers to the planting project that consists of a sequence activity of nurseries, planting, maintenance, and supervision (Astuti et al., 2018).

Members of the mangrove group undertook numerous planting projects with such types of activities. The planting project was time-consuming, and committing to the program was difficult. In terms of planting projects, members of this group propose a contract legally with third parties (e.g., companies, government/private institutions, schools, etc.) to fund planting projects in MMCA under the permission of DLH Balikpapan whether in short-term projects which took a monthly or long-term program that usually required more extensive financial supports. There were procedures to support mangrove conservation in MMCA, as mentioned above. Mangrove group members accepted the stakeholder that agreed to fund all of the
activities in planting projects since it could take years to maintain one task until it was considered successful. Once the project was decided to perform, they had to allocate a location inside MCMA to support the growth of the mangrove seedling. The local group leader said: "We will make a proposal project if the companies want to support until supervision because conservation has to complete until supervision. We also set the name board of the company that funded the project. After the contract finishes, we remove it."

Nurseries

Nurseries were activities of group members who provided mangrove seedlings in planting projects. The leader and the treasurer did nurseries activity, as observed during fieldwork. It enabled them to get income from selling the seedling. The leader said, "This forest belongs to the government, and we have the group. So, the seedlings that used to plant are from us".

These two members did nurseries near their house, as observed (figure 3). Accordingly, they can benefit from selling the seedling for around Rp3,000/bag for selling Rp5,000/seedling in one project. Interestingly, the leader, in particular, involved his wife in nurseries since she has experience in maintaining mangrove seedlings inside MMCA and sometimes being a tour guide for tourists who came to sightseeing in MMCA.


**Figure 2.** Mangrove nursery by mangrove group member (a) the leader have mangrove seedlings in front of his house, (b) the treasurer has mangrove seedling in his house backyard, (c) mangrove nurseries house inside MMCA supported by PERTAMINA.


Recently, the members also took responsibility at the nursery house supported by PERTAMINA inside MMCA. In 2020, they managed 48 meters squared nursery house inside the MMCA with a capacity of up to 4000 mangrove seedlings as part of cooperation with PERTAMINA. The function was not merely to supply the seedlings for the projects. Moreover, it became a learning center about mangroves, including for tourists. Mangrove group members managed mangrove nurseries more professionally since they got supervision from university academics as another stakeholder.
Based on the interviews with members, it was found that only the leader and treasurer were involved in all of the conservation activities: mangrove nurseries, planting, maintenance, and supervision. Members similarly stated that there was no regular time to perform this activity.

**Planting**

Planting activity highlighted conservation towards mangrove forests since the projects involved stakeholders that funded the project to participate. When the project started, it was usually performed with a planting ceremony with the third parties financing the projects. All members participated in this activity (figure 4). Planting benefited members directly through incentives (roughly Rp100,000/day). The members sometimes do running the planting for three days. Likewise, they set such a nominal amount for maintenance and supervision. This activity sometimes involved volunteers from relatives when the project needed more labor. However, volunteers still get paid. The wage for their work likely obscured the meaning of voluntarily used in the management. The fact, conservation projects were not frequently being held. Therefore, members did not consider planting schemes as their side job. Regarding time duration of this activity, there were no certain times to perform following the projects came and the time they agreed on together.

![Figure 3. Planting Activity that Involves Stakeholders](https://www.pertamina.com/en/news-room/news-release/pertamina-enriches-biodiversity-by-planting-1000-mangroves-in-margomulyo)

Furthermore, since MMCA was established in 2004, the most considerable scale of CSR projects the mangrove group managed was environmental CSR projects by PERTAMINA. During the fieldwork, the projects were ongoing and sustained according to the mangrove group members and officials of DLH. Mangrove group members have six years contract (2016-2022) with this company (Figure 5).
In 2016, members of the mangrove group executed a 5000 mangrove planting project from PERTAMINA. The planting activity involved PERTAMINA officials. The latest project that covered the international level was the planting project from Forum Youth 20 supported by World Bank during the G20 Bali summit in 2022 (Figure 5).

### Maintenance

In this stage, members are responsible for maintaining the mangrove seedling that has been planted. There were no certain times, but usually, they went to the planted area two times per month to keep the trees. Many types of activity to maintain the trees, as the treasurer said: "Maintenance including cleaning the garbage and maintaining the guardrail. We document our activities and report to DLH and company. It usually takes a half day inside (MMCA)."

Recently, members also got support from PERTAMINA through a boat to the mangrove group to supervise and maintain the forest, mainly to solve the garbage problem. Moreover, observing four types of activities within the conservation area showed that they do those activities in a particular situation. For instance, when a flood causes garbage to snag in mangrove trees is categorized as maintenance. They clean the garbage and fix the damaged mangrove trees by replanting. All members participated.

### Supervision

All mangrove group members supervised mangrove tree growth (figure 6). In supervision activity, they also coordinated with officials from Margomulyo sub-urban village because shrimp catchers sometimes got inside the MMCA area to set the catch equipment potentially destroying the mangrove trees.

<table>
<thead>
<tr>
<th>2016</th>
<th>2018</th>
<th>2022</th>
</tr>
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<tbody>
<tr>
<td>• Big Planting projects (planting 5000 seedlings gradually in 2016-2020) by PERTAMINA through CSR program</td>
<td>• PERTAMINA gives CSR assistance in form of Rumah Edukasi (Education House) inside MMCA to support mangrove-based ecotourism</td>
<td>• Big Planting projects (1000 seedlings) by PERTAMINA for supporting Coaltrans Asia 2022 and to support the biodiversity enrichment in MMCA**</td>
</tr>
<tr>
<td>• PERTAMINA provided boat to mangrove group Tepian Lestari to support maintenance of mangrove forest (2019)*</td>
<td>• Forum Youth 20 plants mangrove seedlings for supporting the issue of climate change in the series of G20 Summit***</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 4. Planting Projects in MMCA (CSR Scheme) Performed by Mangrove Group Members**

They admitted that they got the payment for this activity since it was not easy to monitor frequently hundreds of mangrove seedlings that had been growing. Even though there was no certain time to monitor the area, the leader and the treasure admitted that they were often to go inside MMCA in a month.

Figure 6. A Mangrove Group Member Measured the Growth of the Mangrove Tree as Part of the Supervision in the Planting Project
Source: Mangrove Group Tepian Manunggal Abadi Document

Participation Experiences in Mangrove Conservation Activities

Long before MMCA was officially established, locals who have occupations as fishermen had conserved mangrove forests in Margomulyo. They planted mangrove seedlings in damaged areas of former shrimp ponds. Initially, it aimed to maintain the mangrove forest resources as their source of livelihood.

Interviewees who expressed their participation as experiences in planting projects were found to be either members of the former group "Tepian Lestari" or non-members. Members of former mangrove group and outside of the mangrove group similarly admitted that they participated in the first planting project in 2007. DLH Balikpapan supported the project of 7000 mangrove seedlings to encourage awareness of local people of Margomulyo towards the mangrove forest degradation.

During the period of conservation effort, several NGOs (international & local) involved in mangrove conservation activities (JICA, Yayasan Selamatkan Teluk Balikpapan etc.) which not merely join in planting project, but educated local people regarding the importance of mangrove forest to their sustainability life. In terms of how they participate, it showed differences (figure 7). In general, interviewees admitted that they got payment of roughly Rp100,000/day from their participation.
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Types of Participation Experiences

Planting activity was the highest compared to other activities, which became the experience of local people (66%). Several interviewees also expressed their nursery activity since they can get money by selling the seedling (Rp.3000/seedling). Meanwhile, local people who expressed their experience in more than one activity showed that they participated in nursery, planting, maintenance (3%) and nursery, planting, maintenance, and supervision (11%). Fishermen were mostly experienced in each type of activity. In addition, Javanese was mostly involved in planting, and Buginese predominantly held experience in nurseries. As the management strategy of planting projects has changed to CSR projects and coordinated with the current mangrove group, they were no longer participating.

Reasons for Participation in Mangrove Conservation Activities (Non-Members of Mangrove Group)

At the beginning of MMCA establishment, the planting project was not directly executed. It took two years after the establishment to hold planting projects. As the first project for planting 7000 mangrove seedlings, the Government under DLH involved local people to participate. Therefore, most of the local people have experience in this project.

Mostly, the reasons local people participated that they were encouraged by the DLH officials and Margomulyo suburban village (kelurahan) officials. It was supported by a statement of the official of DLH Balikpapan, who said that many local people got involved along with Government officials, military (TNI) staff, and high school students when the Government started the planting projects in 2007. Moreover, all of the interviewee's responses showed that they had compensation in the form of payment for their labor and time; it took only a day as well. Hence, this activity relatively does not disturb their primary job.

Subsequently, interviewees who similarly experienced planting projects influenced their attitude when discussing the main benefits derived from the presence of mangroves in their area. The experience of flood and garbage raised their concern about being involved in any
collective activities related to the environment. In addition, interviewees who experienced supervision voluntarily participated in their initiative.

Local People's Willingness to Participate (WTP) in Mangrove Conservation Activities

Despite limited project access, local people tended to exhibit a WTP in planting projects. A similar statement of WTP if they had an opportunity, though they did not have high expectations to be invited to the projects. WTP among local people to participate in the planting projects run in MMCA revealed different answers. There were differences in WTP in preferred activities, preferred time allocation, and preferred type of job. Planting was the most preferred of four types of activities for local people outside the mangrove group. They showed WTP in this activity since they experienced benefits and were not time-consuming. Fishermen found were most enthusiastic. The analysis found that other than planting, the nursery was also preferred by Buginese people.

Local people have different preferences regarding time allocation to participate, yet "no certain time" mainly emerged. For the type of job, "a part-time job" was prominently preferred by interviewees from different occupation backgrounds, ages, income levels, education, and ethnicity. Besides, participating as "volunteers" also became the preference of a few of them. As conservation activities were not a regular program, local people were willing to be involved yet kept focus on their primary occupations. In addition to it, there were Javanese interviewees who preferred to be a volunteer. Certain considerable conditions of this choice emerged, such as gotong royong (collective action), and the conservation activities did not interfere with the primary job (time). Similar to Javanese, voluntary without pay was found in Buginese interviewees. However, they only have a WTP for this type of job if they work together or gotong royong and if there was an instruction from the government elites or head of RT.

Regarding the exclusiveness of planting projects, it also had observable impacts on local people's life. The local people outside of the mangrove group expressed the complaint, though they dominantly exhibited their expectation to get engaged in the projects at the same time. It was shown among fishermen. They complained about the impact of the conservation management, particularly the decrease in their income since they had been prohibited from fishing near the forest according to the regulations. Yet, seeing how the principles worked in the field was perceived as more complicated than how it was formulated. Fishermen perceived the officials were inconsistent in enforcing the regulations. They compared how they fished but kept obeying the rules with the companies that operated alongside the Somber River near MMCA, violated the rules, and had no sanctions. These accounts highlighted the importance of considering local people's interests in forest resources. They would be more willing to participate if the rules did not harm them, as they could compare the different conditions of their living before and after the establishment of MMCA.

Several joined a fishermen's group, which was established at RT 40. A Javanese fisherman leads this group who also a member of a former mangrove group. Observation of this group resulted in information regarding activities that distinguished this group from the mangrove group. They opened networks with companies or institutions (e.g., TBBM Pertamina company, Somber Petrosea company, and Fisheries Agency) to support them related to their occupation, such as boat machine assistance. They frequently gathered to discuss their livelihood problem
regarding the mangrove forest resource restriction due to the current management of MMCA policy (Figure 8).

**Figure 8.** Fishermen who Joined the Fishermen Group Discussed with the Representative of One Company to Start Cooperation  
*Source: Author*

Despite different ethnic backgrounds and income levels, they admit they have a good relationship as a group member and fisherman. Based on observation, several members of this group were not merely from RT 40, yet the fishermen live at RT 41. According to the leader, the number of members dominantly comes from local people that settled at RT 40.

**Reasons for Having Willingness to Participate (WTP) in Planting Projects**

Interviewees expressed more than one reason for their WTP. The categories of reasons appeared to differ; maintaining good social relations among local people, getting paid, environmental awareness, and Government instruction and WTP if there was a group. Different reasons emerged when interviewees were categorized based on their socioeconomic background. Regardless of the perceived economic benefit expectation from the project, interviewees expressed maintaining good social relations as the main reason, mostly stated by Javanese. Meanwhile, a WTP, if there was an instruction from the Government to participate, was expressed mainly by Buginese interviewees. Likewise, the experiences in the past projects that emerged their awareness towards mangrove forest sustainability were associated with the level of willingness to engage again in further conservation projects. Fishermen mostly expressed this statement.

The statement "good relationships" and "gotong royong" (collective activities) recurred throughout the dataset, indicating that besides members, non-members of the group felt like they belonged to their community. These statements explained how they defined questions regarding relationships with others (members and non-members) related to the different access towards management of mangrove forests and the action that represent such relationships. Activities of "gotong royong" – they name it "kerja bakti" (working together) – in particular, were about environment awareness, such as cleaning the garbage near the houses and the forest, cleaning the ditch, making a garbage dump, and cleaning other public facilities near the mangrove forest area (e.g., mosque). Their participation was based on the invitation of RT leaders. According to the head of RT 42, he did not frequently implement "kerja bakti" with
schedule, since most of his people were busy on weekends. However, he added that "kerja bakti" was usually done on Saturday. The cohesiveness of local people in such activity demonstrated the capability of the heads of RT to mobilize local people to participate.

However, the attitudes of the local people were not altogether positive. There were still a few of them showing unwillingness to participate in mangrove conservation. The reasons for not being interested in such activities differed. They did not find such direct benefits for their life. Moreover, they have less awareness of mangrove forest conservation activities because they were more focused on their job unrelated to mangrove forests. They also did not have time to join and were busy with their job.

**Local Dynamics Related to Mangrove Conservation Access as an Indicator of Local People’s Attitudes (Discussion)**

The findings pointed out how local people participated and had a WTP in planting projects as the embodiment of their attitudes differed. This study argued that local people have different participation and WTP, and their reasons were mainly associated with their socioeconomic background and access to mangrove conservation projects. They were discussing who and how local people have access to participate in planting schemes; this study revealed that there were key differences among individuals that explained the interrelation of the dynamics of socioeconomic status, social relations between members within the group and outside of the group, and networks with the Government that related to the concept of social capital (Bennett & Dearden, 2014; Valenzuela et al., 2020). Overall, it demonstrated that local people who participated as group members represented fishermen since the mangrove forest users and a conservation effort in Balikpapan were particularly highly attached to this occupation (Arnez, 2017).

Different backgrounds where the leader, with an occupation as the guardian that also stated his social status, demonstrated trust and good social relations regarding direct connection between the leader and the government officials. Furthermore, specific relation among individuals within the group was prominent for their participation in planting projects, for instance, in the recruitment of member. This situation was aligned with the common evidence on the other mangrove groups in Indonesia, which still rely on personal relations such as relatives-based recruitment to participate in mangrove conservation through group and how then social status can benefit local people in conservation projects (Damastuti & de Groot, 2017). Meanwhile, in contrast to the characteristic of the member group, which was found to be highly homogenous in other areas, such as the case of mangrove group members in Demak, Central Java province, Indonesia, that identified as Javanese-Moslem members (Triyanti et al., 2017) and in Bengkalis, Riau provinces, Indonesia where Javanese exclusively managed mangrove forest conservation (Osawa, 2016) which resulted in a high bonding social capital through collective action, mangrove group members in this study represented a heterogeneous group member, particularly occupation and ethnicity. Yet, they have good relations represented in collective action on the projects. Lamsal et al. (2015) and Karmakar (2018) found that local people living alongside mangrove forest areas and depend on the mangrove forest can be identified by ethnic background.

Furthermore, the exclusiveness of mangrove group members of "Tepian Manunggal Abadi" regarding access to the planting projects became another issue about local people's
Local People’s Attitudes Towards Mangrove Conservation Effort in East Kalimantan, Indonesia

WTP. Linking social capital through their networks with Government and bridging social capital outside of the mangrove group is necessary for the effectiveness of mangrove conservation programs (Triyanti et al., 2017). A present management structure that limited access for local people to participate still being happened in many other areas in Indonesia, such as in the mangrove group that performs conservation in Sinjai South Sulawesi consists merely limited up to 25 persons (Arfan & Taufiq, 2017), or among groups that have different access and management to conservation as the case of protection in four villages in Central Java (Damastuti & de Groot, 2017).

While the previous study revealed the negative attitudes of local people due to socioeconomic status and access to mangrove forests (Armitage, 2002; Bennett & Dearden, 2014; Osawa, 2016; Simarmata, 2012), this study emphasizes vice versa and encounters more abundant reality. Although a lack of bridging social capital was found from evidence of the establishment of fishermen groups, local people with different socioeconomic backgrounds were bonded by cultural values to maintain their relationships in society. Thus, strengthening this value is significant to enhance the cooperation of local people (Arnez, 2017; Bennett et al., 2017; Sukardjo, 2000; Tole, 2010) in the conservation effort. Several cases escalated the dynamics of inequality social and economic, including ethnic and class-based hierarchies regarding access to mangrove forests, as stated by Wever et al. (2012) and Armitage (2002). Although this study include ethnicity as a socioeconomic element of local people in Margomulyo, this study was not in line with those previous findings. Local people's relationship in Margomulyo has different circumstances from those in other mangrove areas. For instance, Simarmata (2012) addressed social structure in society that emerged competition in fish ponds activities in Mahakam Delta, East Kalimantan. The rich people (Buginese) implemented the customary rules of patron-client and benefited them upon the forest area for ponds production. Similar to it, Armitage (2002) looked at the issue of differentiated based on ethnic background as shrimp ponds entrepreneurs (Chinese descendant and Buginese) and local people in Banawa Island, Central Sulawesi. Immigrant dominated the forest areas for production activity legalized by local Government and diminished the common property rights rules of the Kaili people and harmed the conservation goals. While social status polarized local people in those places, local people in Margomulyo tended to show conformity. This dynamic further pertained to their support to MMCA management and planting projects within or outside the group, even though the complaints occurred from local people outside the group.

The finding of this present study was similar to Badola et al. (2012), where the local people in Bhitarkanika Conservation Area (BCA) in India showed positive attitudes through their WTP in forest conservation. This attitude emerged optimistic as long as they could get benefits from protection. The socioeconomic condition of local people in this area was similar to that of locals around the MMCA, except Badola et al. (2012) did not use ethnicity as part of the socioeconomic profile of locals around BCA.

CONCLUSION

Local people's participation and WTP were meaningful in social development in a mangrove conservation area. The study's findings confirmed that although local people had such a positive attitude inclination, they did, however, differ in the way they participated and WTP. The reasons that drove them to have such attitudes also differed. Findings showed that
the reasons to participate and have a WTP were associated with their access to the projects (either through mangrove group memberships or outside of the mangrove group) and the dynamics of several socioeconomic backgrounds, mainly occupation and ethnicity. A good relationship between them generates a positive attitude, notwithstanding limited access to planting projects. In addition to it, since DLH Balikpapan changed its strategy from being thoroughly Government funded to a corporate social responsibility (CSR) strategy, the projects were more exclusive. This strategy seemed to play a significant role in terms of accessibility to the projects nowadays that influence how the local people participate and have a WTP.

Although the current study was based on a small sample of participants, the findings suggested that in line with the social capital concept, the Government can utilize the good social relations that already exist in the community to support mangrove conservation. Inclusivity in mangrove management and giving them more access to participate would prevent conflict among local people, especially in heterogeneous communities.

Several questions remain to be answered. One of them was the involvement of women in conservation, whether they have influence in conservation as well as improving their life quality in terms of economic and social aspects.

REFERENCES


