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Research Article

The Role of Community Social Capital in Sustainable Peat Management: A Case Study from Tanjung Leban Village, Bengkalis Regency, Indonesia

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ABSTRACT

This study aims to identify activities and challenges as well as analyze the social capital of Disaster Concerned Communities (DCC) in sustainable peat management in Tanjung Leban Village, Bengkalis Regency. This study uses a qualitative methodology to systematically analyze community social capital in sustainable peat management, where the Nvivo 12 Plus software is used to analyze data and answer research questions posed. The results of this study indicate that the activities of the Disaster Concern Community (DCC) in Tanjung Leban Village in preventing forest and peatland fires include three phases of activity, namely the prevention phase (conducting routine patrols in finding hotspots and conducting outreach and education to the community), the extinguishing phase (collective fire suppression activities), and the peatland restoration phase of former burnt areas (planting and land rewetting activities). In the process, these activities still face challenges due to natural factors such as the structure of peat soils and hot weather which tend to be highly flammable, as well as internal (lack of solidarity) and external factors (lack of local government support). Then, the success of Tanjung Leban Village in recent years in reducing the number of land fires is the result of social capital which is dominated by aspects of institutional norms (30.76%), followed by 3 (three) other aspects, namely institutional social networks (23.08 %), institutional identification (23.08%), and trust in institutions (23.08%). Therefore, social capital is a crucial instrument in influencing the success of sustainable peatland management activities. Therefore, this research has an urgency and contribution to peatland management efforts that require strong social capital to influence the success of sustainable peatland management activities.

Keywords: social capital, Disaster Concerned Communities, peatland restoration

INTRODUCTION

Currently, forest and land fires that have occurred quite intensely over the past few years in several regions of Indonesia have become a serious issue both nationally and internationally. This happens because the impacts are very complex in the fields of health, environment, society, economy, and education [1, 2]. In a global context, Indonesia is one of the lungs of the world which has a treasure trove of flora and fauna which then has a significant influence on wide-scale climate change. Of course, when forest and land fires occur, it will reduce the forest as well as the fauna that live in it, which will hurt the global climate [3]. In the Indonesian context, forest and land fires have occurred in large areas of dry peat in several provinces such as Riau and Kalimantan. In addition to natural factors, canalization activities for infrastructure development, opening of oil palm plantations and infrastructure needed by the community have a significant impact on the vulnerability of peat areas to fire. Such conditions are also caused by unwise community behavior such as throwing cigarette butts carelessly and using fire as an instrument for land clearing [4–8].

In responding to the problem of forest and land fires in Indonesia, the government has made serious moves to formulate regulations governing the management of peat ecosystems and forest management [7, 9]. One of the serious efforts to improve post-fire conditions as well as prevent fires from occurring is by establishing a Peat Restoration Agency through Presidential Regulation No. 1 of 2016 which is currently renamed the Peat and

Mangrove Restoration Agency through Presidential Regulation No. 120 of 2020. The institution's important task is to focus on carrying out peat restoration efforts in 7 (seven) priority provinces including Riau through community-based cross-sector collaboration, in which in this context Riau Province has a peat area of around 5.09 million hectares (56.42 % of the total peat area of Sumatra) so that these conditions make the Malay land (Riau) one of the focuses of peat restoration by the Indonesian government [7, 10].

In the implementation of efforts to restore and prevent forest fires, encouraging the participation of local governments, communities, and local organizations is the main point. Thus, this is a common issue that requires commitment at the local government level as regulators as well as the community and institutions as partners and the main target of the restoration program [11, 12]. On the other hand, in principle, the community at the village level must also have an understanding and knowledge of various aspects related to community activities and the natural conditions around them. So that various programs for peat restoration and prevention of forest and land fires should involve the community from the planning process to the action [11]. The formation of community groups, both initiated by the government and non-governmental community organizations (NGOs) is an important parameter related to optimal cross-sector collaboration [13]. Not only that, if you look at the context of the field, Disaster Concerned Communities are one of the frontlines at the village level formed by the Regional Government to prevent forest and land fires [14].

The existence of these community groups in the process will provide benefits in knowing early on the risk of forest and land fires so that handling can be done more quickly. It is this benefit that makes every region in Riau, including Tanjung Leban Village, have similar community groups that work in harmony based on the provisions of a legal entity decree or independent initiative. The Disaster Care Community (DCC) in Tanjung Leban Village currently has 18 members. On the other hand, DCC does not work alone, they actively collaborate with various institutions from inside and outside Tanjung Leban Village such as the Fire Department, police, universities, NGOs, and so on to jointly carry out activities related to fire prevention. Community participation in protecting and managing peatlands in Tanjung Leban Village is going well through several activities such as patrols finding hotspots in the forest. Patrols are carried out every day through the monitoring tower to see if there is smoke and indications of fire. Even though the risk of forest and land fires occurring in Tanjung Leban Village is quite high because around 90% of the land is peatland that has been planted with oil palm by the community, the conditions on the ground were found to be interesting, where the performance of forest and peatland fire prevention by the Community Concerned About Disasters (DCC) in Tanjung Leban Village showed positive results. Over the past five years, the following data shows that the area of forest and peatland fires in Tanjung Leban Village has tended to decrease and can be controlled as shown in Table 1 below:

Table 1. Data on forest and peatland fires in tanjung leban village in the last five years

Number	Year	Area (hectare)
1	2018	150 hectares
2	2019	90 hectares
3	2020	60 hectares
4	2021	45 hectares
5	2022	20 hectares

Source: Field data, 2023.

The achievements in Table 1 above are conditions that are supported by positive cooperation, communication, and coordination between DCC and partners who have been actively involved in other peat restoration and fire prevention projects. The uniqueness of the Disaster Concern Community (DCC) in Tanjung Leban Village can be seen from the side of their success in carrying out their duties and roles for fire prevention with several other interesting things which are the basis for why this study is crucial to conduct. Where with all the obstacles and challenges that exist, DCC can provide good performance. This is not necessarily owned by other groups so the results of this study are expected to be an example to be applied in areas with similar problems. Therefore, this study aims to identify the activities and challenges of the Community Concerned about Disasters (DCC) and to analyze the social capital of the Community Concerned about Disasters (DCC) in sustainable peat management in Tanjung Leban Village, Bengkalis Regency.

LITERATURE REVIEW

Fundamentally, social capital is an interaction that allows a person to create a community, bind each other to other members, and build a social order [15]. Social capital can only be formed if there is trust among community members. That's why it is called social capital because it is a social ability to create and maintain a sense of trust in society [16]. Trust is the way individuals control their social relations informally. People who believe in others have hopes or anticipations about the behavior of the people they trust. Trust between individuals develops into trust in new people and widespread trust in social institutions. Then that trust eventually becomes a collection of values, virtues, and expectations in social institutions. The concept of social capital is building or rebuilding community and trust which includes face-to-face interactions [17–19]. There are several important elements in social capital which include both actual and virtual (potential) resources, networks, and relationships that value or pay attention to each other. The actors involved in the network both desire a network of social relations that can be exploited as resources that bring economic benefits or social benefits [17, 18, 20].

Then, several previous studies have explained the usefulness of social capital. Research by Jalil et al., [21] explains that building collective action for efforts to manage and restore sustainable peatlands requires a component of social capital to be identified and utilized because in the process social capital will play a role in the success of groups that manage peatlands without burning and requiring intervention from the government to support the development of high social capital. Then, the peat ecosystem is one of the main ecosystems that must receive special attention from the government and requires increased transparency and space for more optimal community participation [22]. This is in line with the research of Zulkarnaini et al., [23] who explained that people living on peatlands are very dependent on the values and functions of the surrounding ecosystem. Thus, it requires empowerment to strengthen social capital in meeting its needs based on community-based peatland ecosystem management. In addition, aspects of social capital such as coordination, cooperation, trust, concern, and information flow have influenced the success of restoration activities [24].

METHOD

This research was conducted in Tanjung Leban Village, Bandar Laksamana District, Bengkalis Regency (Figure 1). Tanjung Leban Village was chosen as the research location because of the characteristics of the soil of Tanjung Leban Village which is mostly peat soil and the number of forest and land fires that occur almost every year, and this village has been designated as one of the restoration focuses by the Peat Restoration Agency of the Republic of Indonesia.

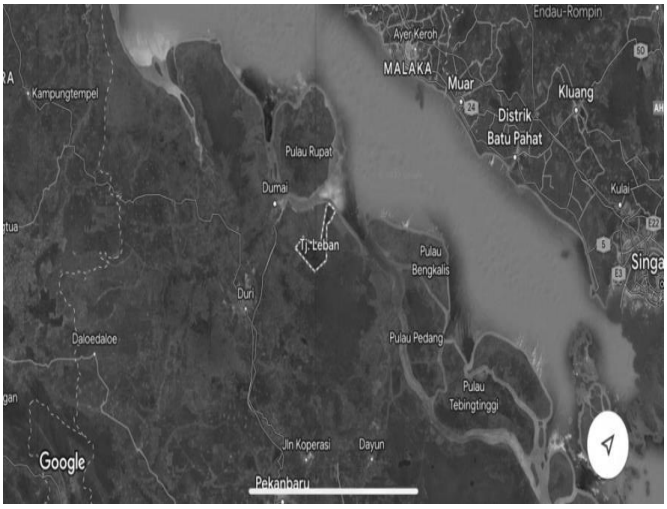

Figure 1. Research location map

This study uses a qualitative research methodology to investigate case studies that occur systematically [25]. The data in this study are primary and secondary data, where the results of observations and interviews with key informants are the primary data used, while secondary data is obtained from various sources such as government websites, appropriate books, and research journals [26]. This study will focus on gathering information on community social capital in sustainable peat management through a combination of data collection techniques which include observation, documentation, and in-depth interview techniques.

Furthermore, the data analysis technique for this study used the Nvivo 12 Plus software through the crosstab query and concept map analysis features to explain the variables that affect the research object, explain informants' perceptions of the concept and perform data visualization with crucial combinations [27, 28]. In the process, the research data analysis was carried out in two stages, namely: *First,* analyzing the data with the crosstab query and concept map analysis features to find the percentage of concepts (nodes) and informant perceptions based on variables and data visualization in the research context to be answered. *Second,* conclude and interpret the primary and secondary data that has been analyzed. Therefore, this study will analyze the social capital of the community in sustainable peat management in Tanjung Leban Village, Bengkalis Regency.

RESULT AND DISCUSSIONS

4.1 Activities and challenges of disaster concerned communities (DCC) in preventing forest and peatland fires in tanjung leban village

Forest and peatland fires are an important issue that is included in the concentration of the work program and is one of the responsibilities of the Community Concerned About Disasters (DCC). The Disaster Concern Community (DCC) in Tanjung Leban Village has made efforts to prevent forest and peatland fires based on collective internal groups and collaborative partnerships that are not only focused on peatland fires but also on disasters that might occur in Tanjung Leban Village such as abrasion on the beach. In general, the activities of the Disaster Concern Community (DCC) in Tanjung Leban Village in preventing forest and peatland fires include three phases of activity namely the prevention phase, the fire suppression phase, and the restoration phase which can be seen in the Concept Map analysis in Figure 2 below:

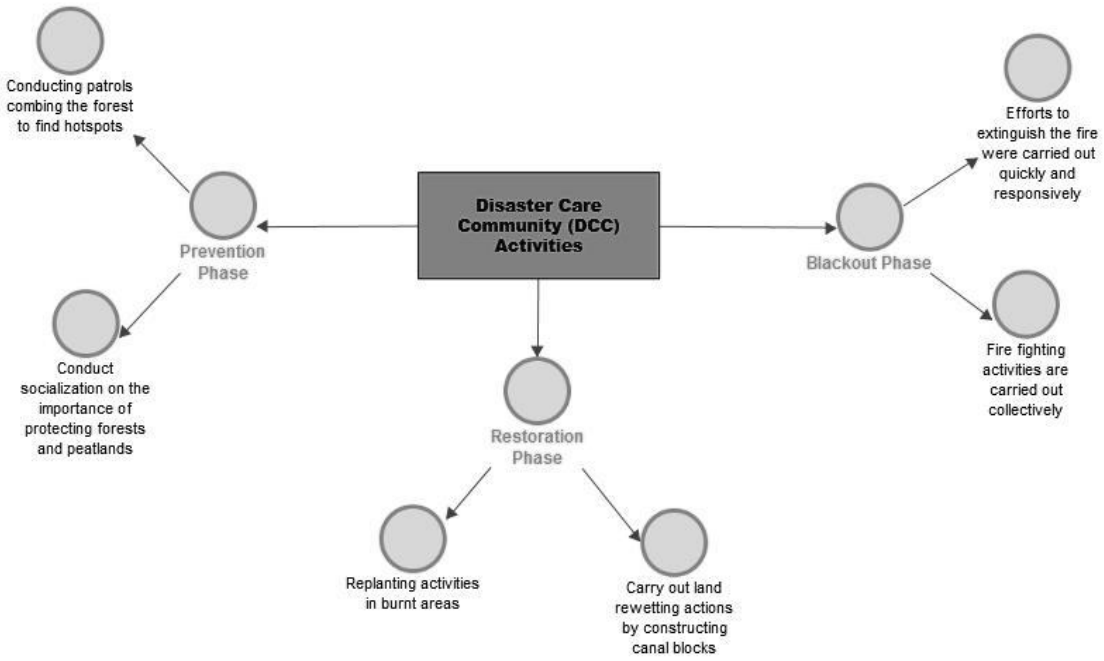

Figure 2. Concept map analysis on disaster care community (DCC) activities in tanjung leban village

In Figure 2 above, it can be seen that the Tanjung Leban Village Disaster Awareness Community (DCC) has several activities in efforts to prevent forest and peatland fires which are divided into three phases, namely: *First,* in the prevention phase, the Tanjung Leban Village DCC has conducted patrols combing the forest to find hotspots that are likely to cause forest and peatland fires and has conducted outreach to the community regarding the importance of protecting forests and peatlands in the village and the correct way to care for forests and peatlands. In socializing and educating, DCC members also provide information about the dangers of the habit of clearing land by burning and prohibitions against burning, and fines that will be given if residents are caught burning land.

Figure 3. Hot spot patrol routine actions by the disaster concern community (DCC)

Second, during the extinguishing phase, DCC members continue to carry out fire fighting activities with full collective responsibility until the fire is completely extinguished. Efforts to extinguish the fire by DCC members were carried out quickly when they received information that a hotspot had been found and immediately rushed to the location that had been informed by carrying an extinguisher in the form of a water suction machine to douse the fire.

Figure 4. Fire fighting action (fire) by the disaster concern community (DCC)

Third, in the restoration phase, the DCC of Tanjung Leban Village has carried out restoration actions on former burnt peat areas, where in carrying out restoration activities DCC members are assisted by the community in cooperation in carrying out several activities such as replanting burnt areas with the aim that the land does not become idle land or empty land which will result in land fires reoccurring in the area, as well as carrying out canal

blocking as an action to discuss land around the plantation with the aim that the peatlands receive sufficient water supply and do not experience drought, especially during the dry season. Canal blocking to wet the peat land in Tanjung Leban Village can be seen in Figure 5 below:

Figure 5. Canal blocking for wetting peatlands in tanjung leban village

In the process, the activities of the Disaster Concern Community (DCC) in Tanjung Leban Village in preventing forest and peatland fires still face several challenges, namely: *First,* there are natural factors such as the structure of peat soil and extremely hot weather which tends to burn very easily in Tanjung Leban Village, as well as geographical conditions and the location of the forest which is quite far from human settlements and the occurrence of peatland fires in different places. *Second,* there are internal and external factors such as a lack of solidarity among DCC members, where there are still some disputes between several members within the DCC institution which can potentially damage communication between DCC members. In addition, the lack of support and funding from the government has also had a direct impact on the performance of DCC members, because assistance from the government is not permanent and unsustainable.

1.2 Social capital of disaster concerned communities (DCC) in sustainable peat management in tanjung leban village

Essentially, social capital has crucial benefits in the public sphere and can be an important instrument in the success of restoration programs [21–24]. Based on the results of interviews analyzed using the Nvivo 12 Plus software through the crosstab query feature, results were obtained related to informants' perceptions of the crucial aspects of social capital by the Disaster Concerned Communities (DCC) in Tanjung Leban Village on sustainable peatland management which included aspects of institutional identification, trust in institutions, institutional social networks, and institutional norms as shown in Figure 6 below:

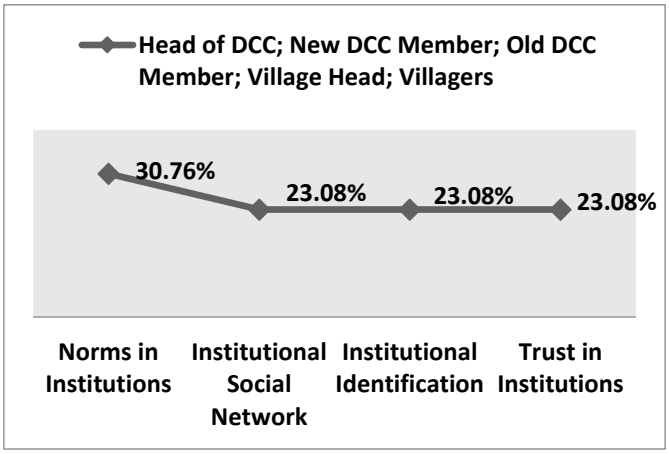

Figure 6. Crosstab query analysis on social capital of sustainable peatland management in tanjung leban village

In Figure 6 above, it can be seen that the social capital of the Disaster Care Community (DCC) in Sustainable Peat Management in Tanjung Leban Village is dominated by aspects of institutional norms (30.76%), followed by 3 (three) other aspects, namely institutional social networks (23.08%), institutional identification (23.08%), and trust in institutions (23.08%). If explored in more detail, informants' perceptions dominate the aspect of institutional norms because to prevent peatland fires, the Tanjung Leban Village Disaster Concern Community (DCC) issued an oral rule containing an appeal to the general public to avoid not to commit an act that has the potential to cause a land fire. This rule works well because DCC members socialize well. Then, with self-awareness, in recent years the practice of clearing land using a completely controlled burning system has even decreased in number (Table 1).

On the aspect of institutional norms, the Tanjung Leban Village community uses deliberation and mediation in resolving land tenure disputes or conflicts. The stages used by community to resolve problems when land disputes occur are carried out in stages starting from the Neighborhood Association (RT), Community Units (RW), Hamlet Head, Village Government, and traditional leaders to the District. In the process, when there are conflicting parties, the head of the RT will summon them for a joint deliberation witnessed by local community leaders. If there is no common ground at the RT level, then it will be continued to the RW level and so on up to the village government. If the deliberation pathway from the RT level to the village government cannot be resolved, then the problem will usually be taken/taken legal route. Even though so far there have been no disputes or land disputes between residents that have been brought to the realm/legal route because they can still be resolved in amicable and deliberative ways. Then, to prevent peatland fires from occurring, the Tanjung Leban Village Disaster Concern Community (DCC) issued an oral regulation that contained an appeal to the general public to avoid and not commit an act that has the potential to cause land fires. This rule works well because DCC members socialize well. Furthermore, with self-awareness, in recent years the practice of land clearing using the burning system and those using the Merun system has been completely controlled and even reduced in number. From this point, it can be understood that in principle the community has the awareness to maintain and implement existing norms, including verbal ones. This arose from a sense of desire that there would be no more fires in Tanjung Leban Village while at the same time supporting sustainable peat restoration.

Then, on the aspect of the social network of institutions, the network in peat restoration in Tanjung Leban that is very prominent is the partnership with the Peat and Mangrove Restoration Agency of the Republic of Indonesia (BRGM) within the 3R peat restoration framework (Rewetting, Revegetation, and Revitalization). For more or less 5 years the partnership relationship with BRGM has been going well. Various technical and social-related peat restoration programs are packaged in an aspect called community-based peat restoration. For example, canal-blocking projects, planting peat-friendly vegetation, and sustainable economic revitalization. The ability to build networks with the people of Tanjung Leban, especially in their social institutions, is quite good. Other partners participating in peat restoration are companies in Tanjung Leban, including PT. Bukit Batu Hutani Alam, PT. Sumber Tani Agung, and PT. Sekato Pratama Makmur through fire fighting activities with the Disaster Concern Community (DCC). Even so, the community and village institutions do not provide a positive reciprocal relationship to the partnership network that has been formed. Where peat restoration projects are not followed by community participation in active fire prevention. Support for sustainable peat restoration is also still weak as evidenced by the inability of the village government to maintain the existence of a large number of forests. In the process, there has been a conversion of forest functions for oil palm plantations and company concession areas even though the village government through its power can maintain the existence of the forest in various ways so that peat restoration remains sustainable so that the benefits are truly felt by the community.

Furthermore, in the aspect of institutional identification, the Disaster Concerned Community (DCC) in Tanjung Leban Village already has an institutional structure in a formal organization at the village level and has clear functions in controlling hotspots, mapping burn-prone areas, and tackling forest and land fire disasters with other formal and informal stakeholders in Tanjung Leban Village. Next, on the aspect of trust in institutions, there are 20 social institutions in Tanjung Leban Village with active, very active, and less active statuses. In terms of daily life, especially those closely related to peat restoration, the element of trust is an important part. The results of observations and interviews conducted found that all subjects who were part of village institutions agreed that trust is a very important part of everyday life, especially regarding peat restoration projects. Community members who are members of associations voluntarily believe that each association can work well to make peat restoration

activities successful. This can be seen from their success in reducing the number of forest and land fires in recent years which have been quite under control (Table 1).

Based on the findings and discussion above, it appears that this research is in line with the findings of Zulkarnaini et al., [23] which explains how social capital factors such as institutional identification, institutional social networks, trust in institutions, and institutional norms influence the success of peat restoration activities. Furthermore, the development of collective action for sustainable management and restoration of peatlands requires identifying and utilizing components of social capital, because social capital will play a role in the success of groups that manage peatlands without burning and requires government intervention to support the development of high social capital [21].

CONCLUSION

The findings of this study indicate that the activities of the Disaster-Concerned Community (DCC) in Tanjung Leban Village in preventing forest and peatland fires include three phases of activity, namely the prevention phase (conducting routine patrols in finding hotspots and conducting outreach and education to the community), the extinguishing phase (collective fire extinguishing activities), and the peatland restoration phase of former burnt areas (planting and land wetting activities). In the process, these activities still face challenges due to natural factors such as peat soil structure and extreme hot weather which tends to burn easily, as well as internal (lack of solidarity) and external factors (lack of local government support).

Furthermore, the success of Tanjung Leban Village in recent years in reducing the number of land fires is the result of social capital which is dominated by aspects of institutional norms (30.76%), followed by 3 (three) other aspects, namely institutional social networks (23.08%), institutional identification (23.08%), and trust in institutions (23.08%). Substantively, the existence of an oral rule (institutional norm) that contains an appeal to the wider community not to commit an act that has the potential to cause land fires is an important instrument in social capital that influences the success of sustainable peatland management activities in Tanjung Leban Village. In addition, this is also supported by aspects of institutional capacity in building social networks, institutional identification, and trust in institutions.

This study provides recommendations to each stakeholder to strengthen community-based social capital in peat management. This is considered strategic because social capital allows the actors involved to be more equal in their roles to achieve success in sustainable peatland management. This research approach has limitations because it only evaluates data from a certain period. As a result, further investigation is needed to gain knowledge over a more complete period. This study also proposes that further research be able to comprehensively map the strengthening of social capital in adopting more optimal sustainable peatland governance.

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