

How trust influence social capital to support collective action in agroforestry development?

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Abstract. *Qurniati R, Febryano IG, Zulfiani D. 2017. How trust influence social capital to support collective action in agroforestry development?. Biodiversitas 18: 1201-1206.* Trust is an important factor for strengthening social capital. Trust in forest community is achieved through collective action in small scale agroforestry. It was challenging process regards the low on social capital in communities. This study intended to analyse and explain how trust influences social capital in encouraging collective action in agroforestry development. The study conducted in Sidodadi and Sumur Kumbang Lampung Province, from October-December 2016. The area was selected based on disparities of sea level of villages. The data collected through in-depth interviews with several members of farmer group who responsible for agroforestry. The research found that trust between farmer group member remains high. However, trust as a source of social capital was not supported collective action since farmer group institution is weak. Therefore, to support agroforestry development, social capital should be increased through the development of good networks (bridging) to reach collective goal i.e. community welfare and sustainable forest management.

Keywords: Agroforestry, collective action, social capital, trust

INTRODUCTION

Degradation of land and forest resources continues from time to time results some negative impacts such as the destruction of ecosystems, poverty, food insecurity and climate change. Agroforestry is expected to be one solution to these problems because its strength as the element of livelihood, which can be used to address the socio-economic issues related to forestry and climate change. Agroforestry is a system of integrated land use. It combines the land-based plant trees/wood and crop at the same time or shifting that turns simultaneously to have the function of ecological, economic, social and cultural rights (Mbolo et al. 2016; Reid 2016; Lasco et al. 2015; Wijayanto and Hartoyo 2015). Based on the study conducted by Iskandar et al. (2016), the community tends to succeed in developing swidden farming into a sustainable traditional agroforestry system, despite population growth, forest depletion, and intensive market penetration.

Agroforestry management is not only influenced by physical and economic capital but also social capital. Social capital is an essential aspect of community forest management implementation (Guillen et al. 2015) because communities surrounding the forest have limited physical and economic capital. Therefore, the communities need to preserve social capital to improve their economic well-being both directly and indirectly (Iswandono 2015). Social capital is a non-material form of capital (Szulecka and Secco, 2014). Putnam (1993) defines social capital as trust, norms, and networks, which can improve the efficiency of

society by facilitating coordinated actions. The strong social capital can be a consideration of the government to support development programs (Roslinda et al. 2017). Social capital can facilitate the collective action of society and provide a strong influence on the process of improving social welfare. The value of trust in social capital is dominant as the basis for rural communities to increase respect and mutual benefit. Trust is a fundamental component of social capital formation in rural areas, while other aspects (cooperation and networking) will not be well established if not based on mutual trust between community members (Cahyono 2014; Innah et al. 2013).

Fisher (2013) points out that trust becomes an important catalyst that allows passive information to be transformed into valuable knowledge. The idea is supported by Guillen et al. (2015) who argued the importance of personal relationships and the catalyst role of social capital ties in forest management. Koutsou *et al.* (2014) showed farmers' trust tend to increase at individual level, particularly for farmers who take collective action as well as allowing farmers to be flexible in adapting to new conditions. Febryano et al. (2014) explain that the high level of trust, understanding, and compliance can be seen from the support and active participation of the community against the agreed rules in forest management.

Many successful collective actions have been achieved by communities in agroforestry management, but those still face some challenges when dealing with low social capital in society. Nooteboom (2006) pointed out that the measurements of trust are objects of the trust, aspects of

behavior, the limits of trust, and the distinction between reliability. Therefore, this study aimed to analyze and explain how trust influences social capital to encourage collective action in agroforestry development in forest area managed by surrounding community.

MATERIALS AND METHODS

Study area

The research was conducted for three months (October-December 2016), at two locations in Lampung Province, Indonesia; Sumur Kumbang Village, Kalianda District, South Lampung Regency and Sidodadi Village, Teluk Pandan Subdistrict, Pesawaran District. Sidodadi and Sumur Kumbang, just like other villages in Indonesia are agricultural areas and most of the population is engaged in farming. The topography of Sidodadi Village is lowland (7-25 m above sea level) and is approximately 29 km from the capital city of Lampung Province; while Sumur Kumbang is a plateau and located at 400 m above sea level and is about 68 km from the capital city of Lampung Province.

Sidodadi and Sumur Kumbang are surrounding forest villages. Land management in both villages is done by applying agroforestry pattern. Sidodadi Village is adjacent to Wan Abdul Rahman Forest Park (Tahura WAR), whereas in Sumur Kumbang is located in the area of Forest Protection Management Unit (KPHL) Rajabasa. The average land holding of the community in Sidodadi ranges from 0.25 to 4 ha whereas in Sumur Kumbang varies from 0.25-1 ha. Sidodadi community who manage the forest does not have land outside the forest, on the other hand, almost all of the community in Sumur Kumbang owns land outside the forest.

Data collection is done in several ways: structural interview, in-depth interviews, observation, focus group discussion and document analysis. The collected data are then analyzed descriptively on how trust influences social capital to support collective action in agroforestry management. The analysis used four implications of trust measurement implications by Nooteboom (2006). First, it should be clear what the object of trust is, such as: whether institutional, organizational, or individual. Second, a distinction must be made, between trust in competence and trust in intentions or, in implementation a distinction between opportunism and lack of commitment. Third, one should be aware that trust always has its limits, so the question is not so much whether there is trust, but how far it goes, where its limits are, and to what those are due. Fourth, a distinction should be made between reliance and trust, i.e. between control and trust that goes beyond control.

RESULTS AND DISCUSSION

Agroforestry development

The communities of Sidodadi and Sumur Kumbang lived and settled in the forest until the late 1980s. However, after the government implemented the reforestation program, they were forced out of the forest. Hence, the dependency of livelihood on the forest was still high as they kept extracting forest to fulfill their needs even though they no longer living in it. The livelihood continued degraded the forest by cutting the trees down and started to grow coffee and cocoa as monoculture system. According to Hidayat (2017), people's dependency upon surrounding forest is common, particularly for communities living adjacent to natural forests.



Figure 1. Research location in Lampung Province, Indonesia. A. Sidodadi Village, Pesawaran District, B. Sumur Kumbang Village, South Lampung District

In 2000's in Sidodadi there was a change of cropping pattern from coffee or cacao monoculture to a mixed pattern of coffee or cacao and Multi Purpose Trees Species (MPTS). The change in cropping pattern was firstly introduced in community forestry program (HKm) establishment. The implementation of HKm is by involving forest farmer groups under the forestry service. HKm is primarily implemented to achieve two goals; improving people's livelihoods and forest conditions (Mohammed and Inoue 2012; Kaskoyo et al., 2014). Sidodadi community is recommended to plant high canopy plants such as wood and MPTS and is prohibited to cut tree stands in the forest. Some trees species that exist in community management areas are *taboo* (*Tetrameles nudiflora*), *benda* (*Artocarpus elasticus*), *gondang* (*Ficus variegata*), and *bayur* (*Pterospermum javanicum*). MPTS were planted between coffee and cacao that already exist in the land. The seedlings of MPTS were provided by the government and distributed through the farmer groups. Some MPTS species grown are coconut (*Cocos nucifera*), durian (*Durio zibethinus*), rambutan (*Nephelium lappaceum*), candlenut (*Aleurites moluccana*), mango (*Mangifera indica*), cinnamon (*Cinnamomum burmannii*), areca (*Areca catechu*), cempaka (*Michelia champaca*), duku (*Lansium domesticum*), and avocado (*Persea americana*). Kaskoyo et al. (2014) argued that the purpose of growing MPTS species in HKm area is to enrich or expand existing farmland cover to create a multi-strata crown.

In contrast to Sidodadi, the former forest area in Sumur Kumbang was dominated by *repong damar* trees; a local name for damar (*Shorea javanica*). Besides damar, there are *gintung* (*Bischofia javanica*), *gelam* (*Melaleuca leucadendron*), *kedaung* (*Parkia roxburghii*), *dadap* (*Erythrina variegata*), and *kiara* (*Ficus sp*) with its average diameter ranges from \pm 40-80 m. Damar is the main source of income for the community, but when production and prices of damar fall, the trees are cut down and replaced by coffee and cacao in monoculture system. Accordingly, coffee and cacao replace damar as the main source of income for the community. Subsequently, since the community management area of Sumur Kumbang became part of Protection Forest Management Unit (KPHL) of Rajabasa in 2011, information about the importance of high canopy plant increased and people started planting MPTS.

Currently, forest cover conditions in both villages are better but not dominated by forest trees (wood) but MPTS that was grown with agroforestry patterns. The willingness of the community in Sidodadi to grow MPTS between coffee and cacao based on their awareness of the importance of water conservation functions (ecological). In line with Roshetko et al. (2013); Rahman et al. (2014); Rahman et al. (2017), agroforestry is a dynamic ecologically-based practice of growing trees on farmland alongside crops. The communities in both villages realized since forests were dominated by cacao and coffee, many water springs disappeared. Moreover, the river became dry and caused lack of water in the dry season. At this time, tree species were planted mainly near the water spring outside the community management area, while MPTS

planted inside the community management area. In addition to its ecological function, MPTS plant can be a long-term source of income considering that MPTS product can be harvested only once a year. To earn a short-term income, communities plant low canopy vegetation among MPTS such as bananas (*Musa sp.*), chili (*Capsicum sp.*), tomato (*Solanum Lycopersicum*), celery (*Apium graveolens*), lemongrass (*Cymbopogon nardus*), turmeric (*Curcuma longa*), and ginger (*Jingiberis rhizoma*). Hasbullah et al. (2016) stated that the people who planting multiple crops have great hope and suspend the sources of income from multi-purpose tree species. When the main crop production is no longer optimal, they still can have income from distraction plants (MPTS and crops).

Sumur Kumbang community has a better knowledge about the benefits of high canopy plant, however only some of them willing to plant MPTS on their land. On the other hand, most people in Sidodadi agree to plant MPTS in their land. The Sumur Kumbang community does not expect the productivity of coffee or cocoa decline due to MPTS canopy cover. In Sumur Kumbang, most of MPTS is the existing plant in the community management area and new planted MPTS are still few and they only plant on the empty area, interrupted between by trees, and coffee or cacao. Various efforts to increase public trust in developing MPTS in Sumur Kumbang continue to conduct by the government (KPHL) and universities.

So, to promote the sustainability of agroforestry, the community create an unwritten rule regards MPTS planting and harvesting in the forest area. Institutional protection by custom rules provides greater space for civil society to participate in the efforts to achieve sustainability of function and utilization of forest resources (Hidayat 2017). In Sidodadi, the community who do not plant MPTS in their forest areas will be penalized, and will not allow managing the land in the forest. In addition, if someone cut a tree in the forest, then he will get a penalty and has to plant 10 trees as a replacement at the same site. Similarly, the Sumur Kumbang also has an unwritten rule related to the planting of MPTS in forest areas. However, the content of these regulations has not been socialized to the communities. Rules and sanctions refer to mutually agreed behavior patterns and the degrees of compliance of individual behavior in the community (Szulecka and Secco 2014; Nursidah et al. 2012). Until now there are no members of the community in two villages who violate the rules. Common rules, norms, and sanctions are the mutually agreed or handed-down norms of behavior that give individuals the confidence to invest in collective action, knowing that others will do similarly (Roslinda 2016).

Trust and collective action in agroforestry development

Trust is focused on personal relationships underlying agroforestry application in the forest area. Suharti et al. (2016) stated that trust has become crucial in a daily relationship. The relationship is influenced by the characteristics of individuals in the community. When people repeatedly communicate and interact with each

other, they can learn whom to trust, and how to organize themselves to gain benefits and avoid harm (Schauppenlehner-Kloyber and Penker 2016). Nahapiet and Ghoshal (1998), argued that at an individual level, the source of trust derived from the values originated from religious beliefs, the competence of a person and openness among the community members. The Sidodadi and Sumur Kumbang communities are relatively homogeneous. Sidodadi community is dominated by Javanese (89%) and Sumur Kumbang is dominated by Sundanese (95%). The majority of the populations in these two villages are Muslims. The similarity in tribe, religion and family relationships that exist in Sidodadi and Sumur Kumbang communities strengthen the trust in the community, as bonding in social capital. Bonding social capital is presented as trust among closer and exclusive networks where members know each other very well (Guillen et al. 2015). With strong bonding, communities become more open to communicate and coordinate to manage the land in forest areas. In line with Acedo and Gomila (2015), trust can be identified as a key determinant of the quality of cooperation and participation. The greater sense of trust to others means stronger cooperation among the people. Subsequently, trust among the people then increases their awareness on the benefits of growing woody perennial/MPTS instead of only coffee and cacao in their land.

Trust requires the truster vulnerable, taking a risk that the trustee will act in their best interest (Buntain and Golbeck 2015). The strong communities trust in Sidodadi and Sumur Kumbang is implemented by their willingness to replace coffee and cacao with MPTS. This decision brings the implication that people need to seek alternative income as a substitution for coffee and cacao to meet both short-term and long-term needs. Nevertheless, Evizal et al. (2016) found that shade trees with high percentage of MPTS have an adverse impact on coffee productivity. However, this does not discourage the communities in both villages to continue developing agroforestry. They implement the cash crop combination (coffee, cacao) with MPTS to increase their income. Unfortunately, due to the limitation of land holdings as well as the lack of knowledge and skills of the community to generate income from off-farm, imposed the people on working as on-farm laborers. Accordingly, limitations to seek alternative or additional income can be a threatening the trust of the community to maintain their land with agroforestry system. In fact, people's dependence on forest land is very high. Hasbullah et al. (2016) state, in the socioeconomic dimension, finding the solution for alternative income that can increase the farmer revenue is crucial.

The trust of Sidodadi community to plant woody perennial/MPTS is also influenced by the farmer awareness of their physical ability. As they are getting older, their ability to work in agricultural land will be increased. MPTS is more suitable for elderly farmers because it does not require regular maintenance, while in contrast, coffee and cacao plants should be maintained regularly for optimal results. In addition, MPTS has a long period in production that can be considered as savings (income) in the future.

The cocoa-based agroforestry systems could be implemented to conserve biodiversity (forest tree species) of surrounding forest landscape through a multi-purpose based approach of forest tree species (Mbolo et al. 2016). Understanding about the importance of MPTS for biodiversity conservation should be provided for the community of Sumur Kumbang.

The increasing level of trust amongst the community in both villages is as a result of the decreasing level of illegal logging, as well as the community effort in controlling the forest fire. The existence of mutual trust causes unrequired supervision because others behave in accordance to the desired. As stated by Schauppenlehner-Kloyber and Penker (2015), trust is a special thing that importance for the success of a process and to greater motivation for collaboration. The monitoring of illegal logging in Sumur Kumbang has been conducted by the cooperation between community and forest police. While in Sidodadi, an additional help comes from *Mandor* (forest administrator). *Mandor* is a native of Sidodadi who works as a volunteer in supervising the illegal logging activity. However, *Mandor* still gets paid for about 200,000 IDR/15 USD per month by the government just for transportation fee. *Mandor* in Sidodadi is actually in charge of supervising the management and utilization of forest areas, but nowadays they also act as a mediator between communities and the government. *Mandor* is the most community trusted party to be asked forest management issues. Forest police and extension staff have never provided guidance and extension to Sidodadi community directly, although the community feels the need of coaching to increase their knowledge and skill in forest management to improve their social welfare.

The lack of communication process between the government or other stakeholders with the group member still happens in both villages. The role of the government is far from community's expectations, particularly in Sidodadi. Cooperation and coordination between government and community in Sidodadi were well conducted during 2000-2004. However, as the police of HKm program in protected forest expired, the collaboration between the community and the government also ended. Currently, communication between the community in Sidodadi and the forestry department (government) insufficient. In contrast, the community in Sumur Kumbang is still accompanied by the government through KPHL Rajabasa and also local NGO as a representative under KPHL program. The government representative communicates intensively only with the administrators of farmer groups, hence the coordination is not optimal and far from community's expectation. This condition can be a threat of trust in forest management, particularly in agroforestry development. The communications between community and external parties (bridging) could have a significant role to change and bring progress and innovation for group members (Qurniati et al. 2017). Bridging of social capital could represent a more sustainable alternative, increasing the long-lasting institutional trust that is less dependent on certain individuals. Achieving a good balance between bonding and bridging social capital is necessary. It means, there is a

need to improve generalized trust among parties outside the group (bridging), so they can take part in open and inclusive networks providing collective benefits, to become a member of farmer group.

The farmer group in Sidodadi was formed in 2000, but since 2004 there has not been group activity at all. Meanwhile, the group at Sumur Kumbang was formed in 2013, but since the group formation is top down, participation of the members of the group is quite low. Those weaken farmers groups in both villages and instigate lack of coordination and communication both inside and outside of the group. The ability to act is a prerequisite in creating added value for the organization. This requires an ability to communicate and coordinate honestly and correctly, ability to build an emotional bond, a passion for dialogue, cooperation skills as a team, and ability to learn and adapt, as well as efforts to increase participation (Nurtjahjawilasa et al. 2015). The coordination and communication will affect the collective action needed to achieve collective goals of the society. The low of collective action in both villages are reflected particularly from limited cooperation that can be established between local people with other parties outside the group in joint activities or in responding to the existing problems to increase community's welfare.

Local institutions play an important role in resource management, as communities take an active role in implementing legislation for collective action in sustainable resource management (Febryano et al. 2014). Collective action for the natural resource management shapes by individuals and its transformations within groups and individuals. It holds the greatest promise for the collective and sustainable governance of natural resources (Meilasari and Sugiana 2012) and individuals who can mitigate negative outcomes resulted from resource use that livelihoods depend on (Senganimalunje et al. 2016). Agroforestry is intended to be an alternative for sustainable forest management, unfortunately collective action on developing agroforestry practices in both villages is still weak. The high of trusts in both villages have not encouraged collective action. Agroforestry was practiced individually, but due to their limitations regarding financial capital and technical assistance in the management of agroforestry, products resulted from agroforestry are only for subsistence. Therefore, it requires a permanent network (not project) with a bridging party so that the community can improve the relationship collectively. Provision of technical experts related to agroforestry management and policy makers and access to funding source are tremendously needed. By applying agroforestry techniques, surrounding forest communities could increase their social economic condition while assuring sustainable forest management.

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