The implementation of community-based forest management (CBFM) schemes within the protection forest management unit (PFMU) Sijunjung, Indonesia

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Abstract. Community-Based Forest Management (CBFM) has been implemented in West Sumatra Province since 2012 targeting 500,000 ha State forest land. It is part of a total of 12.7 million ha of forest areas designated for CBFM in Indonesia. This paper aims to describe the implementation of CBFM schemes in the working area of PFMU Sijunjung in terms of its institutional and forest utilization activities by the local community, beneficiaries of CBFM. This study was carried out in three CBFM with the forest size ranging from 217 – 504 ha. CBFM schemes implemented in this area consist of Community Plantation Forest (CPF), Community Forestry (CF), and Village or Nagari Forest (VF). The data were collected through observation and key informant interviews. The study found that Community Forestry and Community Plantation Forest are managed by re-institutionalizing existing local institutions. In contrast, Nagari Forest is managed by new institutions established by the village government. Institutional formation in each CBFM scheme is motivated by government policy. Institutions of Community Forestry and Community Plantation Forest are secure enough in terms of institutional activities, agreed rules and restrictions applied, the beneficiaries community only harvest Non-Timber Forest Products (NTFPs). This practice may lead to sustainable forest resource use. On the other hand, the new institution of Nagari forest has created a conflict of interest between the parties so that the institution becomes weak, and the rules in management are not easy to be agreed. Consequently, the community still widely practice illegal logging in various scale. This study concludes that CBFM practice should consistently encourage local institutions as the core of forest management, as stated in the PFMU long-term plan instead of establishing new institutions. Therefore, the CBFM program should strengthen local institutions and promote synergy among multi-stakeholders.

Keywords: CBFM Schemes, Institutional, forest resource utilization
1. Introduction

West Sumatra is one of the provinces in Indonesia, with a population of about 5.4 million people. The province's total land area is approximately 4.2 million hectares, which is 2.3 million hectares designated for forest area, and 0.1 million hectares is peatland forest [1], and many communities live in and around forest areas. The existence of communities living around the forest area has direct or indirect access to forest areas, and the state forest managements have to face the fact these people use forest resources. This condition has a positive or negative impact on forest sustainability. West Sumatra has lost 578,372 hectares of forest land over the past 25 years [2]. The loss due to the conversion of forests, illegal logging, and mining inside forest areas. The transformation of the forest into other land uses occurs both legally and illegally. To block the pace of forest change, the national government recently has adopted the ecological rescue and livelihoods of forest communities through a Community-Based Forest Management (CBFM) policy known as the Social forestry program. Social forestry, as a government policy, is a new collaboration between communities and governments to achieve sustainable forest management [3].

West Sumatra provincial government since 2012 has targeted 500,000 ha of CBFM out of a total of 12.7 million ha national government CBFM targets. Sijunjung regency of West Sumatra is included in community-based forest management targets within a protected forest area of 50,000 hectares [4], and more than 50% of the people live near forest areas. Given the fact that communities live and carry out the economic activities in and around forest areas, they have a quite high dependence on forest resources. Their intense interaction with forests has made communities an essential element in achieving sustainable forest management.

There is various problem occur in forest management, including forest utilization activities. The complexity of issues concerning forest utilization for different purposes requires a strategic step in managing forest resources. Community-Based Forest Management (hereafter CBFM) approach is proven to be an effective way of resolving forest management problems. CBFM is forest management in which local communities manage forests within their territory using their old customary rules or with legal rights [5]. CBFM can also be interpreted as collaborative forest management where the State decentralizes the forest management function to local communities, smallholders, as well as state-owned companies [6]. CBFM has double objectives; to improve community welfare and to sustain forest resources. This scheme enables communities living around the forest to have the knowledge, understanding, and a position to respond more quickly to the problem of the resources around them, such as fires, encroachment and illegal logging. At the same time, they also depend on this resource base for their survival [7]. Forests are Common Pool Resources (CPR) that are vulnerable to overexploitation and thus threatens its sustainability [8]. There several factors that influence the success of collective action in managing common-pool resources. These factors, among others, are; favorable state policies, demographical change, as well as technological change. In the end, the market plays an important role related to the outcomes from local-level collective action, along with characteristics of local communities, institutions, and resources [9]. Ostrom [10] emphasizes eight design principles (EDP) for the success of common-pool resources institutions. EDP includes; clear defined boundaries, congruence, collective choice arrangements, monitoring, graduated sanctions, conflict resolution mechanisms, minimal recognition of rights to organize and nested enterprises. It is understood that the institution plays a significant role in the success of community-based forest management.

Although the certainty about the types of local institutions or tenurial arrangements, the appropriate organizing of sustainable management is still much debated [11]. Thus, CBFM implementation might face success or even failure. The Institutional role is mostly being able to organize and controls the behavior of individuals in society or organization [12]. In other words, the existence of local institutions will be able to encourage the community to collective action through organized activities.

The Indonesia forestry development program, as stipulated in ministerial regulation No. P.83/2016 on social forestry [13], adopt CBFM as the primary strategy [3]. The rule provides a legal basis on granting of CBFM licenses to communities living around the forest under various schemes such as
Community Plantation Forest (hereafter HTR), Community Forestry (hereafter HKm), and *Nagari* Forest (Hereafter HN). The people around the forest are encouraged to play more active management roles. How is the implementation of CBFM in current situations? This study attempts to answer these questions in the working area of the Protection Forest Management Unit (hereafter PFMU) Sijunjung. Specifically, the objective of this research is to discover the implementation of CBFM in terms of its institutional and forest utilization activities by the local community.

2. Research Methods

2.1 Overview Study Site

This study was carried out in the working area of PFMU Sijunjung, West Sumatra province. This study selected this site purposively based on the consideration that PFMU Sijunjung was the first PFMU pilot development that covers some CBFM schemes within its working area. The PFMU is responsible for managing these schemes. Thus study focusses on three villages, as shown in Figure 1.

![Figure 1](image)

**Figure 1.** The location of the study site in three villages consists of *Nagari* Silokek, *Nagari* Tanjung Labuh, and *Nagari* Langki.

The three villages have similar ecological and socio-economic settings, but they differ in terms of forest size and CBFM scheme, as presented in Table 1.

| Attribute         | Tanjung Village | Labuh Village | Silokek Village | Langki Village |
|-------------------|-----------------|---------------|-----------------|---------------|
| CBFM Schemes      | Community forestry | Community Plantations Forest | Village or Nagari Forest | Nagari Langki |
| Block of Forest Area | Batang Kuantan stream | Batang Kuantan stream | Sigading hill | Sijunjung |
| Jorong            | Sipuh, Sabiluru, sawah Silupak | Tanjung Medan | Liambang | Tanjung Gadang |
| Sub-districts     | Sumpur kudus | Sijunjung | Tanjung Gadang | |

*Table 1: Comparison of conditions in three villages of CBFM scheme*
| Attribute                  | Tanjung Labuh Village | Silokek Village | Langki Village   |
|---------------------------|-----------------------|-----------------|-----------------|
| Watershed                 | Indragiri             | Indragiri       | Batanghari      |
| Sub-watershed             | Batang Sumpur         | Batang Kuantan  | Batanghari upstream |
| Distance to the capital   | 12 Km                 | 23 Km           | 26 Km           |
| district                  |                       |                 |                 |
| Distance to the regency   | 36 Km                 | 15 Km           | 57 Km           |
| capital                   |                       |                 |                 |
| Climate type and average  | A (169,92 mm)         | A (169,92 mm)   | A (208,50 mm)   |
| rainfall                  |                       |                 |                 |
| Forest size (ha)          | 360 ha                | 217 ha          | 504 ha          |
| The function of forest    | Protection and        | Production area  |
| area                      | production area       |                 |                 |

2.2 Data Collection techniques
The study used both primary and secondary data. The primary data were collected using in-depth interviews. The informants included the leaders of each CBFM unit, the traditional leaders, forest farmers, program facilitators, and forestry officers (PFMU). The collected data were; institutional background, rules, and program in forest management and also socio-economic activities in forest utilization.

All interviews were conducted in the local language in a face-to-face manner by using a questionnaire. Second, data were also collected through observation of forest farmer activities. The secondary data was obtained from related references, such as the regulation of each CBFM scheme and long term forest management plan.

2.3 Data Analysis
The study used descriptive qualitative by process of data reduction, data display, and conclusion or verification.

3. Results and Discussion
The granting of forest management rights to protection and production forests area has provided a guarantee of management space for the community living in and around forests. Still, the giving of these rights does not necessarily cover community governance [3]. Therefore there are two types of forest status recognition in the community, namely forest with CBFM scheme (state-owned) and Ulayat forest (community-owned). PFMU Sjunjunjung in its Long-Term Forest Management Plan has reserved development for CBFM consist of; HN 24%, HKm 70.9%, and HTR 5.1% from a total of 50,000 Ha. This data proves that government support for CBFM is very high when compared with initial reserves are only 10.550 ha. The granting of these rights is with the hope that the community would have legal access to the forest; it gives them a sense of ownership to the forest products. In doing so, the community would make an effort to harness and safeguard the forests in a better way, and the government can control any community activities through the rules embedded in the management rights granted.

3.1. Current institution and the situation in each CBFM Scheme
Tanjung Labuh village has a CBFM Scheme in the form of Community Forest (HKm). The Institutional of this HKm is a Forest farmer's group. This group was enhanced from previous and long lasting institution small groups known as "Batobo". The existence of batobo in term of activities and financing provides from the sale of Non-Timber Forest Products (NTFP) made this group has a strong influence on the community which later on became the basis for the establishment of HKm institutions. This group has been established since 2010 with a membership of 112 people, of which 16
people are core members. The core members in this group are rubber forest farmers who have a Business License for the Utilization of HKm (IUP-HKm) for pine forest. They are involved in institutional arrangements, actively participate in every decision making and carrying out of HKm activities. While the other members are ordinary rubber forest farmers who cultivate land within HKm, they tend to work on their land, do not participate in decision making, but accept the rules and benefits of the existence of HKm. The institutional of HKm has been supported by village leaders (Wali Nagari and Badan Permusyawaratan Nagari) who are the managers of HKm and also adat leader. HKm is not built from adat rules because customary rules in forest management have not been applied. The influence of customary is only in recognition of the status of forest land, which for the local community are Ulayat Forests, except for HKm's area that is recognized as state ownership. In general customary rules are still used in the wedding ceremony. The HKm’s institution is self-sustain. They have funds derived from pine sap, they have good coordination with stakeholders, and they have rules consist of values, norms, and sanctions.

Similar to HKm, The Institutional of Community Plantation forest (HTR) in Silokek village is a group of forest farmers called. The initiation of this group was started in 2009 before the HTR permit was proposed. This scheme facilitated by the government to be formed with a new structure in 2012. In the implementation of HTR activities, land use permits are granted by the government on behalf of each member. However, forest farmers practice group work based on a mutual agreement. Currently, there are 21 persons given forest land use permits with the size of land for each farmer ranging from 8.80 ha to 12.70 ha /person. The leader of HTR is an adat leader in Silokek village. He has a strong influence on forest farmers. The fact is inside adat rules such as values and adat restrictions on land use activities inherent in this institution and the tendency of forest farmers to accept every decision taken by the leader. Mostly, forest management by the local community in this village is grouped into two schemes. First, HTR's area that is recognized by forest farmers as state-owned whose has been given right to use for during a certain period of time, no one can cultivate the same land without a permit from the owner (forest farmers). Second, land within forest areas recognized by forest farmers as Ulayat forest. Ulayat forest is communal land so that it could be managed by anyone with first confirming to Ulayat right holder, adat leader, and his clan. Some forest farmers not only have land within HTR's area but also some of the property within the Ulayat forest, both of them are managed to adjust to their ability. The Institution of HTR has good relationships with the local community and government as a facilitator of their activities. Still, they have weaknesses in developing their businesses in terms of skill, knowledge, and funding. Therefore they are very dependent on programs by the government. That is why the practice is rather slow.

Different from HKm and HTR, Community institutions established to manage state forest areas within HN is called Nagari Forest Management Council (Lembaga Pengelolaan Hutan Nagari or hereafter LPHN). LPHN is formed based on the village regulations, then became the institution responsible for regulating forest management. The parties involved in this institutional arrangement are leaders consisting of adat leaders who called Ulayat owners and village government officers such as top leader, and leaders of the smaller unit called Jorong in this village and the whole community as members. LPHN was created as a new institution facilitated by the government and was not formed from existing groups within the local community. The selection of the leaders within this institution is based on the idea that involving community leaders would have influence in this village. They can encourage the local community to manage forests better under institutional rules. Unfortunately, the current Nagari forest (HN) institution is not running well. The reason is differences in perspective and conflict interests in forest management among involved parties. This condition is more difficult because, since the beginning, the top leader in this village did not fully support this program. While many cases prove that forest management can not be done only by one or two people, it needed a commitment from various parties, including the whole of the local community. This study also found that there is a gap of information within the local community. Almost all of the people did not know about this forest management scheme because the village government handed over the socialization of
forest management to LPHN, while the activity of LPHN was not fully supported by related internal parties. The institutional differences for each of the schemes are summarized in Table 2.

**Table 2: Current Institution of CBFM Scheme**

| Attribute                        | Community Forest (HKm) | Community Plantations Forest (HTR) | Village or Nagari Forest (HN) |
|----------------------------------|------------------------|-----------------------------------|-----------------------------|
| Related regulation in force      | Permenhut no.P.23/2007 tentang HKm, PermenLHK no.P.83/2016 tentang perhutanan sosial | Permenhut no.P.23/2007 tentang HTR, Permenhut no.55/2011 tentang HTR, PermenLHK no.P.83/2016 tentang perhutanan sosial | Permenhut no.P.49/2008 tentang Hutan Desa, PermenLHK no.P.83/2016 tentang perhutanan sosial |
| Forest governance according to the community | HKm and Ulayat Forest | HTR and Ulayat Forest | Ulayat Forest |
| Formally institutions            | Forest Farmer Groups (KTH Sungai Tuo) | Forest Farmer Groups (KTH Minang Saiyo) | Nagari Forest Management Agency (LPHN Langki) |
| Year establishment of the institution | on 2010                | on 2012                           | no detail                   |
| Term of usufruct                 | 35 years with a Community forest concession (Izin Usaha Pemanfaatan Hutan Kemasyarakatan: IUP-HKm; can be extended every 5 years afterward) | 35 years with a Community Plantation Forest for timber concession (Izin Usaha Pemanfaatan Hasil Hutan Kayu: IUPHHK-HTR; can be extended every 5 years afterward) | 35 years with the Rights of Forest Management of Nagari (Hak Pengelolaan Hutan Nagari: HPHN; can be extended every 5 years afterward) |
| Size of membership               | 112 person (core members is 16 person) | 21 person | Including all community in Nagari (no detail) |
| Year issued permission of scheme | the permit have been proposed in 2014, and issued in 2015 | Permits are issued gradually until 2013 | Beginning of 2017 |
| Institutional arrangements       | institutional rules are made and agreed upon by all members | institutional rules adhere to customary rules | Rules are made by the Nagari Forest Management Agency (LPHN) |
| Status of group leader in society | Nagari government officials | Customary leader (Dubalang adat) | Customary leader |
| Enforcement of rules             | Has been done (all members) | Has been done (all members) | Not yet done |
| The form of sanctions            | Social sanctions (verbal warning) and legal sanction | Customary sanctions and legal sanction | There is no clear sanction for violations yet |

It means that strong institutions can manage forests well, can mobilize various parties to take collective action in managing forests; of course, these institutions do not appear in a relatively short
time. Social interactions, norms, and values that have been built in local communities are social capital that forms a network that is the key to whether a right institution is created or not. In other words, social capital is the basis of local institutional formation within the social order. The social capital determines the choice of community action. Digging of social capital enables the coordination of the action and goals of the CBFM[14], expansion of collective decision-making opportunities [15], social cooperation [16], and social networking [17]. An excellent social capital affects the institutional. An institution in the HKm and HTR schemes has proven that utilizing existing local institutions is a better idea in the CBFM program.

3.2. Forest Utilization Activities Undertaken by Communities in the CBFM Scheme

HKm aims to improve the welfare of local communities through the use of forest resources in an optimal, fair and sustainable manner, where the collection of Non-Timber Forest Product (NTFPs) and the use of forest land in several ways is permitted. Timber production is also allowed on a concession basis but only in the production forest area. In the HKm, the status of forest land is not convertible to other land uses [18]. This study, however, found that activities carried out by local communities inside the HKm's area within protected forest function is more dominant than the production forest function. These activities consist of: (1) Collecting Non-Timber Forest Products (NTFPs) such as Rubber, areca nut, durian, nutmeg, and horticultural crops. (2) Tapping a pine-sap; (3) the mangosteen seedling activity is a grant from the government for HKm, that distributed to all members; (4) monitoring and control activities to the forest undertaken by core members of HKm.

Pine-sap was collected on a forest area of 40 Ha by core members of the forest farmer group. The pine-sap is collected in group work, the average pine sap tapped ranges from 50-70 ton/year. Its current selling price is Rp.5000/kg. The proceeds from the sale are distributed as the provision to the Village government of Rp.1750/kg. The fund is used for the village development project.

Forest monitoring aims to monitor forest utilization activities, especially within the HKm area. This group report any illegal logging carried out by the community within the protected forest area, as happened on 2014 it was found that there was a timber harvesting by one of the community, this action was reported by the forest farmers to the head of HKm and village leader, and then resolved by deliberation with social sanction prevailing in the community, this activity can work because the institution runs well so that the forest farmers have already a good understanding of the forest and the same interests to keep forests to be sustainable, and also supported by Nagari government that gives a positive response on every activity undertaken by this institutions; (5) a small portion of land clearing activities are still found to be planted by encroaching, cutting and burning in forests outside of HKm area (Ulayat forest).

In Silokek village, the existence of forest areas is significant to people livelihood, especially after income from gold mining activities is no longer enough to provide income for the community. Hence, a source of income that can still be maintained is from forest resources. In principle, HTR aimed at raising the productivity of degraded production forest areas by setting up plantations by forest farmers as permit holders in the production forest [13]. Forest utilization activity by forest farmers in production forest areas (Ulayat forest and HTR) are: (1) collecting of non-timber forest products is almost the same as the types of commodities grown in Tanjung Labuh village such as Rubber, petai, breadfruit, areca nut, durian and horticultural crops such as cayenne planted on the sidelines of timber plants, most of these commodities for sale and a small portion for consumption such as cayenne, breadfruit; (2) collecting of Timber Forest Products such as cinnamon. In this village, Rubber, areca nut, and cinnamon are the main forest products that make the most contribution in helping the forest farmers income, with the selling price of each commodity; rubber Rp7.500/kg, areca Rp.10.000/kg and cinnamon Rp.30.000/kg. (3) Rehabilitating production forests along the watersheds from 2013, 2015, and year 2017, a collective action undertaken by communities with the government. The government provided seeds and seedlings such as mahogany, matoa, gaharu, and petai. (4) Land clearing without burning, the community maintains the land well, land cleaning is carried out jointly according to the mutual agreement among members known as “Batobo”.

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Village forest or Nagari Forest (HN) is a CBFM scheme where state forest is managed by the community aims at improving the welfare of the villagers themselves by accessing forest resources. A village institution is developed in the utilization of sustainable forest resources, production forests, and protected forests present in the Nagari [13]. But in Nagari Langki the forest function consists of protection and conservation forest. The local community in this Nagari depend on forests. Rubber is a forest product that is used by the local community as a source of income. While other forest products that are utilized by the community are timber forest product is taken in protected forest areas. Illegal logging was done ten years ago, but flare-up in the last five years.

People are aware of the danger from these activities was conducted in protected areas, but they have never felt the real impact of these activities so that the peoples are still doing, in this study, illegal logging is divided into two types are large scale and small scale. The large scale one is done by the top-level who have the power and capital and worker. Meanwhile, the small scale is done by the local community in the low level who do not have the capital, and they cut the tree to meet their needs such as food and to build their own house. The study found that illegal logging occurred because the prices of Rubber and non-timber forest products continued to decline, which made most forest farmers not want to take Rubber and leave it for the last three years. Besides income from cutting wood in the forest is very high for local people, they can earn a profit of Rp. 2,000,000 / week, this is very high when compared to income from other activities such as rubber tapping, rice farmers, and others whose results have to wait for harvest and only obtained in small quantities. Uncontrolled illegal logging activity is also due to the weak role of local institutions, especially forest management institutions of Nagari, in controlling community activities on forests. Nagari leaders themselves involved in illegal activity, so there is no rule enforcement. Besides, the lack of human resources of the government institutions and the robust protection of the community against unlawful logging make government access to the Nagari also limited. Besides, customary rules in forest management in the Nagari are also not functioning correctly.

By comparing forest utilization activities in three CBFM schemes, it can be concluded that forest utilization activities within CBFM schemes can be divided into two objectives; first, for sources of income and second, for forest protection. Communities in HKm and HTR derive their sources of income by maximizing the benefits of NTFPs such as pine, Rubber, betel nut, durian, and others. Besides, they also conduct forest security activities, especially within the CBFM area; this practice is a reflection of sustainable forest management. While in the village or Nagari forest, communities tend to remain extractive by logging illegally at various scales to meet their needs and weak institutional role makes forest security activities also not well.

4. Conclusion
This study concludes that CBFM practice should consistently encourage local institutions as the core of forest management, as stated in PFMU long-term plan instead of establishing new institutions. Therefore, local institutions must be strengthened and promoting synergy among multi-stakeholders. This study is a small part that emphasizes that institutions play a role in determining the behavior of individual communities on forests, determining collective action that is chosen by the community in utilizing forests sustainably or extractive.

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