Media Konservasi Vol.28 No.2 Agustus 2023: 116-128 **ISSN: 0215-1677**
DOI: 10.29244/medkon.28.2.116-128 **E-ISSN: 2502-6313**

SUSTAINABILITY STATUS OF VILLAGE FOREST MANAGEMENT IN PESISIR SELATAN REGENCY, PROVINCE OF WEST SUMATRA

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Accepted January 05, 2023 / Approved May 02, 2023

ABSTRACT

Indonesian law a recognizes new entity for forest management in the form of social forestry, which grants the right to manage to group of people, village management units, cooperative companies, and customary communities. In order to ensure the applicability and accountability it is important to assess the sustainability of Social Forestry management of Village Forests (HD) schemes based on ecological, economic, social and institutional aspects at the site level. This study aims to reveal the sustainability status of HD management in Pesisir Selatan District, West Sumatra Province as well as to determine the indicators that influence its sustainability. The Assessment of HD in the Pesisir Selatan District (Rap-KPSVforest) used a Multidimensional Scaling (MDS) approach in six cases of HD. The results show that HD Kampung Baru Korong Nan Ampek (KBKNA) and HD Taratak Sungai Lundang (TSL) have the highest sustainability value compared to HD Barung-Barung Balantai Selatan (BBBS), HD Lunang (L), HD Pondok Parian Lunang (PPL) and HD Lunang Tengah (LT). On the ecological dimension, the management of HD KBKNA and HD TSL is considered quite sustainable. However, in terms of the economic, social and institutional dimensions, HD KBKNA and HD TSL have less sustainable value compared to other HDs. Seven indicators are crucial for maintaining HD sustainability namely land cover, forest rehabilitation, sources of business capital, utilization of tourism potential, conflicts over management of yield utilization, distribution of workforce, status improvement of the Social Forestry Business Group (KUPS) as well as the comprehensiveness of the management plan. A multi-business scheme that combines forestry, tourism, agriculture and plantation which has become an integral part and the main source of community livelihood should be continuously developed. This will also increase the resilience of the six HDs because they will not only rely on the agricultural and plantation sectors.

Key words: *multidimensional scaling (mds), rapfish; social forestry; sustainability; village forest*

INTRODUCTION

Social Forestry (SF) has been implemented in many countries in many forms of programmes. In Indonesia, a break through social forestry programme that accomodated the needs of the diversity of social, communities and customary aspects. The programmes are Hutan Desa (HD) or village forest, Hutan Kemasyarakatan (HKm) or community forest, Hutan Adat (HA) or customary forest, Kemitraan Kehutanan (KK) or forestry partnership, and Hutan Tanaman Rakyat (HTR) or community forest plantation unit (KLHK 2021). In this context, Hutan Desa (HD) is a state land that is allocated for and is managed by village management unit for the sake of village development and prosperity of its people. Likewise the overarching goals of social forestry, the implementation of HD is expected to contribute to the curbing of the number of tenurial conflicts, speeding up poverty elevation, and strenghtening sustainable forest mangement, which is facilitated and supported by a mutual interactions between forest and people (Aji *et al*. 2015).

Nationally, there are 12.7 million hectares of state forests that have been allocated for the people through social forestry scheme (KLHK 2020). To date, the area of Social Forestry in Indonesia has reached 5.17 million hectares, which 5.09 million hectares (98.48%) was achieved in the last seven years. Since October 2014, HD have become the biggest part of the social forestry development at 1.97 million hectares or at 38.48% of the total area. Nevertheless, the hike of social forestry coverage has not yet indicating successful forest management and it's sustainability, partly because social forestry is not merely giving asccess to local people, but the main challenge and opportunity are to improve local community capacity in managing their forest resources in sustainable ways (Sahide *et al*. 2020). Although at a glance, the size and coverage of HD could potentially becoming a huge contributor towards National Determined Contributions (NDC) achievement of Indonesia's FOLU Net Sink 2030 (Vita 2021).

Giving the importance of HD within the technical implementation of FOLU Net Sink at its ecology, economy, social and institutional, we need a robust ways of assessing HD's sustainability in several sites in Indonesia that should be a national priority action to be implemented. A study by Wahyu *et al.* (2022) that used Rapid Appraisal for Fisheries (RapFish) investigated management of HD and HKm in Kabupaten Kubu Raya, Province of West Kalimantan and Kabupaten Belitung, Province of Bangka Belitung, which revealed that the majority of the HDs have not met the criteria of ecological, economic and social aspects. Referring to research by Wahyu *et al.* (2022), this study looking at criteria and assessment component of village forest through adding institutional factor with Multidimensional Scaling (MDS) principles in six HDs

in Pesisir Selatan district of West Sumatra Province. The over arching goal of this study is to fill the gap of knowledge of HD management and its sustainability that will benefit national and regional authorities in improving policy and practice towards sustainable forest management in the country.

RESEARCH METHOD

This study was conducted between August and November 2022 in six HDs in Pesisir Selatan District in West Sumatra Province, details of HD is presented in following Table 1 and Figure 1.

Two types of data were collected, primary and secondary. Primary data was collected through structured interview with questionnaire, deep dive interviews and field observation that focused on ecological, economical, social and institution dimensions, see Table 2 on the column of indication value for details. While secondary data was extracted from official maps, planning documents, and management reports of LPHD (Lembaga Pengelola Hutan Desa) from six HD management units. We selected thirty respondents from each HD management unit personel on their understanding towards HD management, income, and personel involevement. The dive interview was carried out to deepen and confirm data set we gained from each HD management unit that targeted chairs of HD unit, Wali Nagari (chief of village), government personel who have responsibility to assist the management units and other stake holders who have relevant information.

We deployed a modified *Rapid Appraisal for Fisheries* (*RapFish*), which initially was used for assessing fisheries management yet with a deep understanding of its concept on sustainability, is applicable for assessing various study (Fauzi 2019). The *RapFish* was then modified and become *Rapid Appraisal for Village Forests* (Rap-VF) that in this study we implemented it with multi criteria principles along with MDS algorithms. MDS maps distance between one unit and others through scaling it so that we should include all units in one analyses (Fauzi 2019). Adding to that, multiple indicators and attributes (6-12) incorporated into this study to gain better results (Pitcher *et al.* 2013; Fauzi 2019).

We performed the analyses through multiple stages, that are: (1) defining attributes into ecology, economy, social and institutional; (2) attributes scoring based on its sustainability criteria and dimension; (3) ordinate analyses of *Rapfish Multidimensional Scaling* (MDS) to quantify the ordinate and stress value; (4) assesing the index and status of the sustainability at each dimension and multi dimensional approach; (5) leverage analysis in ordinate to determine sensitive variable that affect sustainability; and (6) *Monte Carlo* analyses to calculate uncertainty aspects (Fauzi 2019). A brief visual explanation of the analyses is described in the following Figure 2.

We identified 29 indicators that might affect HD sustainability. However, we only included seven indicators within ecology and economy dimension and eight institutional dimension to the analyses. We select 15 out of 29 (52%) of the identified indicator through following guidance that was explained in the Ministerial Decree Number 9 / 2021 but also based on previous studies that are relevant to this study [Wahyu *et al.* (2022)]. More importantly the process in defining indicators should consider type of data and information that have been gathered, objectivity and it's potential of being categorised as extreme good and extreme bad (Fauzi 2019). Study design and attributes that were incorporated in this study are presented in Table 2.

Each indicator in every dimension was weihgted based on how they were ackquired, i.e. sourced from maps, document of planning (incl. field records and notes), spatial analyses of satellite imagery and land cover, interview and field observations. We weighted the data and information ranging from '0' to '4' based on its characteristics either qualitative or descriptive.

Table 1 Research location data

No	Name HD	SubDistric	Number of Members	No of Decree	Date of Decree	Area (Ha)
1.	HD KBKNA	Koto XI Tarusan	462	SK. 5338/MENLHK-PSKL/PKPS/PSL.0/8/2018	20/08/2018	1.635
2.	HD BBBS	Koto XI Tarusan	400	SK. 1282/MENLHK-PSKL/PKPS/PSL.0/3/2018	27/03/2018	432
3.	HD TSL	Koto XI Tarusan	250	SK. 5684/MENLHK-PSKL/PKPS/PSL.0/9/2018	05/09/2018	1.209
4.	HD L	Lunang	927	SK. 1442/MENLHK-PSKL/PKPS/PSL.0/4/2018	02/04/2018	3.233
5.	HD LT	Lunang	371	SK. 1302/MENLHK-PSKL/PKPS/PSL.0/3/2018	28/03/2018	1.163
6.	HD PPL	Lunang	310	SK.2702/Menlhk-PSKL/PKPS/PSL.0/4/2018	30/04/2018	1.386

Note: KBKNA: Kampung Baru Korong Nan Ampek; BBBS: Barung Balantai Selatan; TSL: Taratak Sungai Lundang; L: Lunang, LT: Lunang Tengah dan PPL: Pondok Parian Lunang.

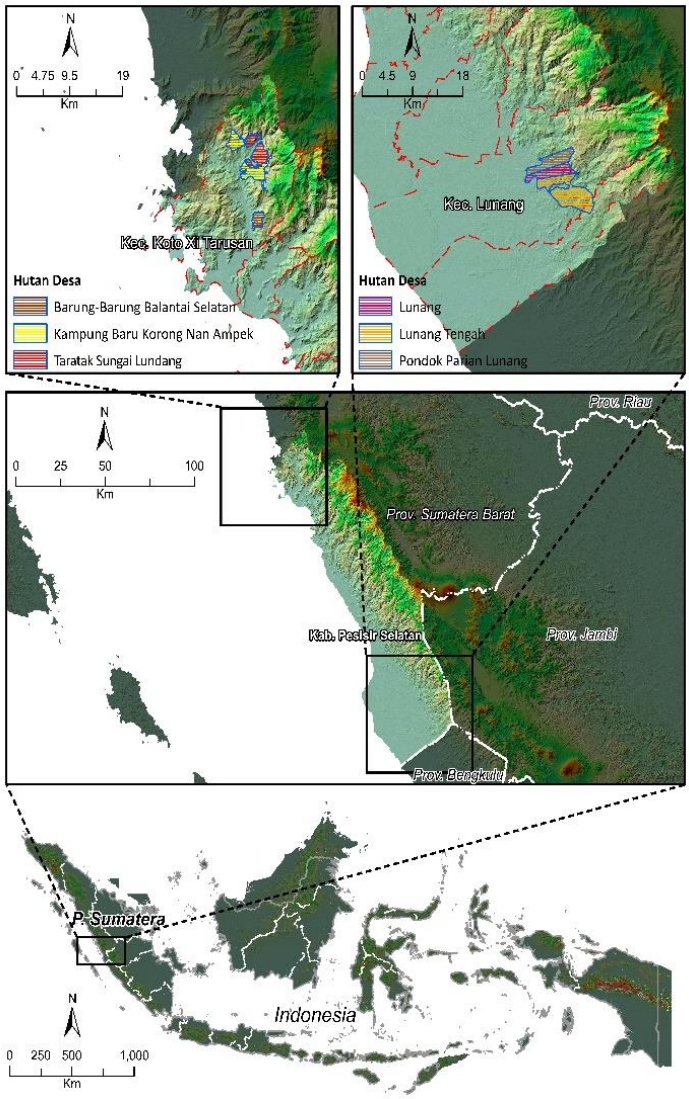


Figure 1 Map of reasearch location HD Lunang, HD Lunang Tengah, HD Pondok Parian Lunang, HD Barung-Barung Balantai Selatan, HD Kampung Baru Korong Nan Ampek, and HD Taratak Sungai Lundang

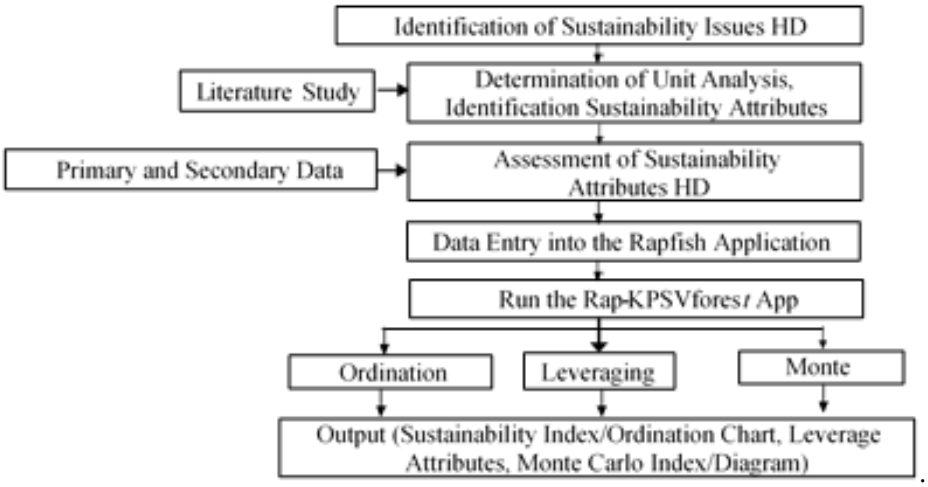


Figure 2 Stages of Sustainability Analysis with Rapfish Application, modified from Fauzi 2019

Table 2. Indicators of sustainability of HD management.

No	Indication Value	Operational definition	Value determination	Resource of Data
		Ecological Dimensions		
1	HD areal boundary clarity	HD area boundaries that have been demarcated or have clear natural boundaries	**0:** The entire HD area has not been demarcated/has no clear boundaries; **1:** 1: 1% to 35% has set limits or has clear limits; **2**: 36% to 70% have set boundaries or have clear boundaries; **3**: 71%-100% have set boundaries or have clear boundaries	Forest area boundary development map; HD acreage maps; Field observation
2	Availability of zoning/blocks for various forest management	Division of the HD area at least into two zoning (protection/conservation and utilization) so as to limit and protect certain areas to be defended/protected	**0:** No blocks/ zoning; **1:** 2 unmaintained blocks; **2:** 1 block is not maintained; **3:** 2 maintained blocks	Management plan document; zoning map; informant interviews; field observations data from Ministry of Environment and Forestry Republic of Indonesia (MoEF)
3	Critical land area	Percentage of critical land in HD area	**0**: above 50%; **1**: 26% - 50%; **2**: 10% - 25%; **3**: bellow 10%	data for 2013 and 2022 are calculated using ArcGis using the Calculate Geometry command; informant interview; activity records/reports field observation;
4	Forest rehabilitation/planting/maintenance activities	Planning and rehabilitation/planting activities carried out and the ability to carry out activities independently/independently	**0**: never; **1**: 1-3 times/year; **2**: 4-7 times/year; **3**: 7-10 times/year	Management plan document; informant interviews; field observations
5	Forest protection/security activities	Planning and forest protection activities (illegal logging, forest and land fires, hunting of wild animals) that are carried out and the ability to carry them out independently/independently	**0**: none; **1**: rarely (once a month); **2**: often (once every 2 weeks); **3**: a lot (4 times a week)	Management plan document; informant interviews; field observations
6	Percentage of forest cover area	Percentage of forest cover area in HD area	**0**: below 10%; **1**: 10% - 25%; **2**: 26% - 50%; **3**: above 50%	Analysis of landsat 5 satellite imagery for 2013-2018 changes, landsat 8 satellite imagery for 2018-

No	Indication Value	Operational definition	Value determination	Resource of Data
				2022 changes and 2013-2022 land cover map; informant interview; activity records/reports field observation;
7	Biodiversity management	Planning and activities diversity management life (inventory, documentation, and management diversity of flora and fauna) and ability to do activity on a basis self help/self	**0**: none; **1**: exists (there is an agreed norm); **2**: exists (there are agreed norms) and implemented; **3**: exists (there are agreed norms) and is monitored	Management plan document; informant interviews; field observations
			Economic Dimension	
1	Contribution to regional development	Economic contributions (directly or indirectly including tax payment obligations, non-tax state revenues, and so on)	**0**: not yet; **1**: indirect contribution; **2**: direct contribution from management; **3**: income tax to the government	Notes/reports income/ finance; payment of taxes; informant interview
2	The income that people get from HD	The average proportion of HD household income	**0**: have not yet obtained; **1**: 1%-30% of household income from HD; **2**: 31%-70% of household income from HD; **3**: 71%-100% of household income from HD	Notes/reports income/ finance; interview respondents (questionnaire); informant interview
3	Product market reach (local, national, international)	Distribution of products produced by HD	**0**: Village/Nagari; **1**: District; **2**: Regency/City Region; **3**:Provincial or National	Notes/reports income/ finance; interview respondents (questionnaire); informant interview
4	Utilization of tourism potential (planning/operational/development)	The creativity of HD managers in exploiting the potential of tourism objects	**0**: none; **1**: exists but has no potential; **2**: potentially; **3**: potential and can be cultivated	Respondent interview (questionnaire); informant interview
5	Utilization of non-timber forest products	The creativity of HD managers to utilize the potential of resin/sap, rattan, essential oils, honey, fruits, medicinal plants, aloes, bamboo, and	**0**: none; **1**: low; (1 to 3 types); **2**: medium (4 to 6 kinds); **3**: high (≥ 6 kinds)	Respondent interview (questionnaire); informant interview

No	Indication Value	Operational definition	Value determination	Resource of Data
		dyes		
6	Sources of business capital (self/support/loan)	Sources of funding for business activities carried out by HD (loans, assistance, self-help/independence)	**0**: none; **1**: loan; **2**: help; **3**: independent	Respondent interview (questionnaire); informant interview
7	Revenue used for forest management	The percentage of forest management costs originating from income earned by HD	**0**: 71%-100%; **1**: 31%-70%; **2**: 1%-30%; **3**: 0%	Income/financial records/reports; interview respondents (questionnaire); informant interview
		Social Dimension		
1	Employment	Percentage of community involvement in HD management	**0**: none; **1**: a little/individual (1 to 3); **2**: group (4 to 7); **3**: all villagers (>7)	Respondent interview (questionnaire); informant interview
2	Benefit distribution mechanism	Mechanism of distribution of income/profits or other benefits from HD	**0**: none; **1**: not effective; **2**: effective; **3**: effective and visible results	Respondent interview (questionnaire); informant interview
3	The level of education of the community around the forest	The average level of community education and management is HD	**0**: did not finish basic education; **1**: base; **2**: medium; **3**: higher education	Respondent interview (questionnaire); informant interview
4	Availability of community organizations for business activities (business groups)	Organizational support at Nagari level in supporting HD management	**0**: no role; **1**: less role; **2**: play an active role; **3**: play an active role with real action	Respondent interview (questionnaire); informant interview
5	Conflicts in forest management/utilization	Impacts and conflict resolution mechanisms that occur in HD/HKm management both within the group (between administrators and members) and external parties (village government, illegal squatters/miners, private companies, other community groups, and so on)	**0**: internal and external conflicts; **1**: internal group conflict; **2**: personal conflict; **3**: none	Respondent interview (questionnaire); informant interview
6	Improvement of community skills	Frequency of counseling/ assistance activities as well as capacity building (planning, implementation of activities, business management, and institutions)	**0**: never; **1**: exist and are in the planning; **2**: exist and implemented; **3**: effective and visible results	Respondent interview (questionnaire); informant interview

No	Indication Value	Operational definition	Value determination	Resource of Data
7	Women's involvement in forest management	Percentage of women's involvement in the management of HD	**0**: none; **1**: only involved in administrative activities; **2**: involved in several activities; **3**: involved in every activity	Respondent interview (questionnaire); informant interview
8	Community understanding of the importance of the value of forest resources	Level of understanding of HD management roles and rules	**0**: don't know; **1**: low; **2**: medium; **3**: high	Respondent interview (questionnaire); informant interview
		Institutional Dimension		
1	There are mutually agreed institutional rules and mechanisms	Supporting rules for HD management other than Regulation of the Minister of Environment No.9 of 2021	**0**: none; **1**: nothing but understands that it needs to be made; **2**: exists but has not been implemented; **3**: exists and has been defined	Respondent interview (questionnaire); informant interviews; notes and documents
2	Regular board meetings and institutional activities involving members	Frequency of meetings/ deliberations held by management and HD members, including business group meetings	**0**: none; **1**: ever (1 time since released); **2**: often but not regularly (2 times a year); **3**: frequent and regular (there are monthly and quarterly meetings)	Respondent interview (questionnaire); informant interviews; notes and documents
3	There are capacity building activities (training, workshops, etc.) either carried out independently or in collaboration with other parties	Frequency of training, workshops, conducted by HD administrators and members, Government and NGOs	**0**: never; **1**: ever; **2**: several times; **3**: often	Respondent interview (questionnaire); informant interviews; notes and documents
4	The level of participation of members in the activities of the PS group	The activeness of members in advancing the management of HD	**0**: none; **1**: passive; **2**: active but infrequent; **3**: always on	Respondent interview (questionnaire); informant interviews; notes and documents
5	Management dynamics and transitions	Frequency of management changes/changes in the LPHD organizational structure	**0**: often changes; **1**: several times changed; **2**: ever and limited; **3**: never	Respondent interview (questionnaire); informant interviews; notes and documents
6	There is an increase in the institutional status of the Social Forestry business	The number of KUPS in HD and the position of KUPS in utilizing HD natural resources	**0**: majority blue; **1**: the majority of silver; **2**: majority of gold; **3**: platinum majority	Respondent interview (questionnaire); informant interviews; notes and documents
7	Management plan completeness	How complete is the forest management plan (RPHD, RKT, RKU)	**0**: none; **1**: exists but incomplete; **2**: complete and implemented; **3**: complete and implemented as well and monitored	Respondent interview (questionnaire); informant interviews; notes and documents

We visualised the ordinate of the attributes into two dimensional graphic. The horizontal axis has important value that indicates the sustainability level of particular unit that ranges from '0' (the worst) to '100' (the best). While the vertical axis represents variations that has no relation wit hthe degree of sustainability (Fauzi 2019). Previous study by Wahyu *et al*. 2022 devided the level of sustainability into four: not sustainable (<25.0), less sustainable (26.01-50.0), fairly sustainable (50.01-75.0) and sustainable (>75.01).

We performed *leverage analyses* to reveal sensitive indicators or those are the main leveraging factors towards sustainability value. Following Fauzi 2019, the value of leveraging factors should fall between 2-6%, which was calculated through oberving the change of *Root Mean Square* (RMS). Meanwhile, we conducted *Monte Carlo* analysis in order to evaluate and to detect the source of error of the variance. Some source of errors might be originated from and affected by various conditions. Interpretation error might be one of the main factor, whereas lack of comprehensive understanding of the sustainability concept and lack of knowledge of field charactersitics may lead to a fatal mistake. *Goodness of fit* analysis in the MDS shows accuracy of the prediction from the real life situation through calculating *Stress* (S) value and determinant coefficient (R^2). In general, we can accept the prediction if S is smaller than 0.25 (Fauzi dan Anna 2002) and R^2 at ~1 indicates a good result. The whole process of the analyses was performed with *RapFish software* that was ran (*add-ins*) in *Microsoft excel*.

RESULT AND DISCUSSION

1. *The ordinate of HD sustainability*

The sustainability of HD management unit that covers four dimensions are shown in the Figure 3. Through MDS validity testing we received 95% confident interval of goodness of fit test's stress and determined coefficient (R2) at <0.25 and ~1, consecutively.

Monte Carlo analysis shows sustainability values that are closely distributed (Figure 4) that indicates the changes of the values are not significant and the ordinating results could overcome random errors (Fauzi 2019; Muchram et al. 2020). Therefore, we are able to extract the values for further assessment.

The following Table 5 and Figure 5 are showing the result of HD management unit in the study area. The results show that the majority of HD management unit sustainability are categorised as less sustainable at all components.

Table 5. Status of continuity of HD management in Pesisir Selatan District, West Sumatra Province.

Dimensions	HD management sustainability index					
	KBKNA	BBBS	KBKNA	L	KBKNA	PPL
Ecology	59,00**	49,65*	52,35**	45,01*	45,01*	45,01*
Economy	41,32*	33,60*	38,00*	44,31*	37,54*	33,59*
Social	44,85*	42,27*	42,73*	41,50*	41,50*	41,50*
Institutional	42,56*	40,10*	36,65*	46,31*	46,31*	31,64*

Note: * less sustainable, ** fairly sustainable

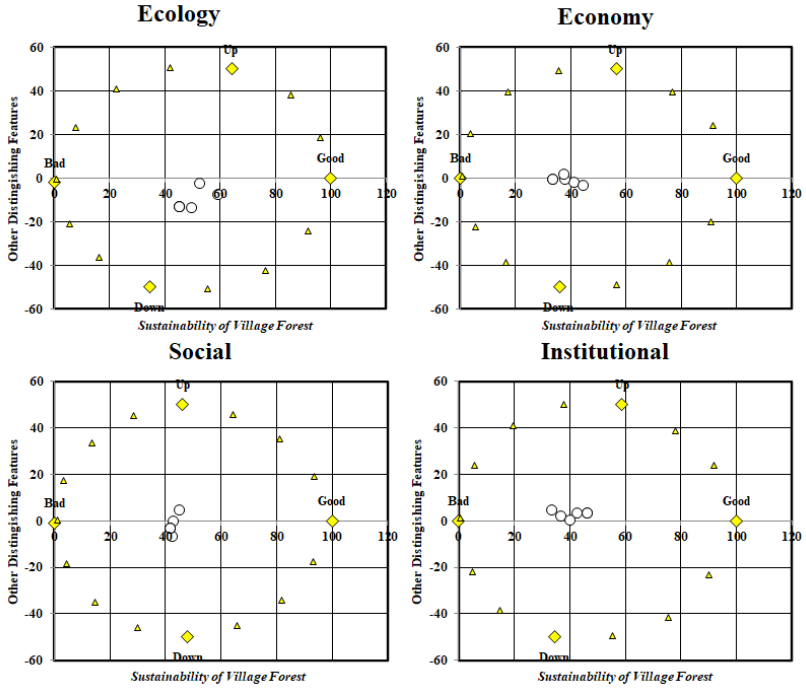


Figure 3 Results of the ordinance of ecological, economic, social and institutional sustainability

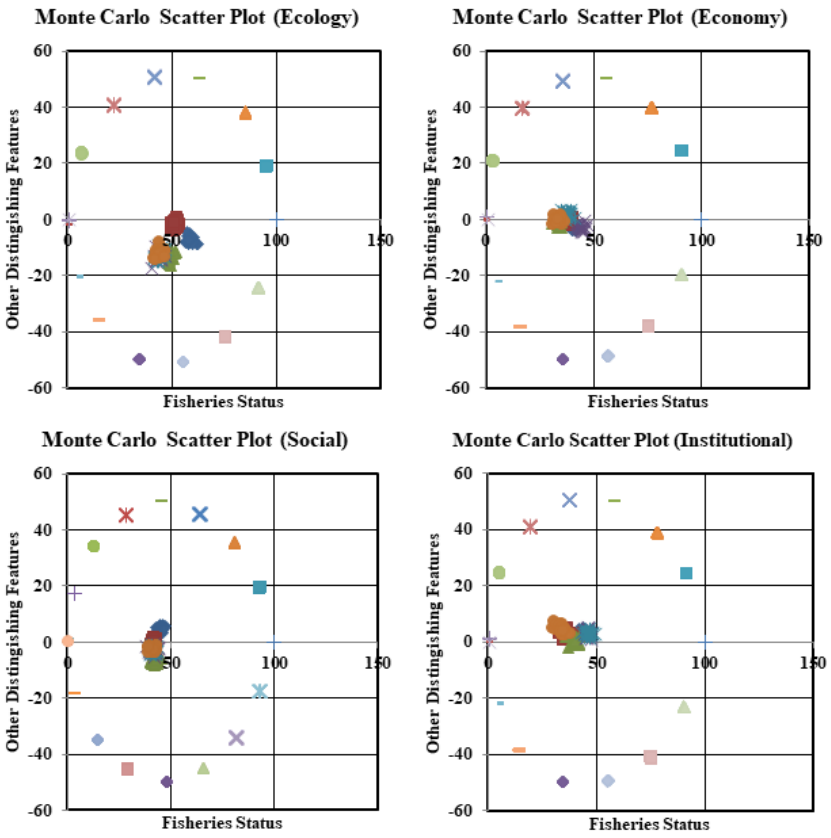


Figure 4 The Monte Carlo analysis

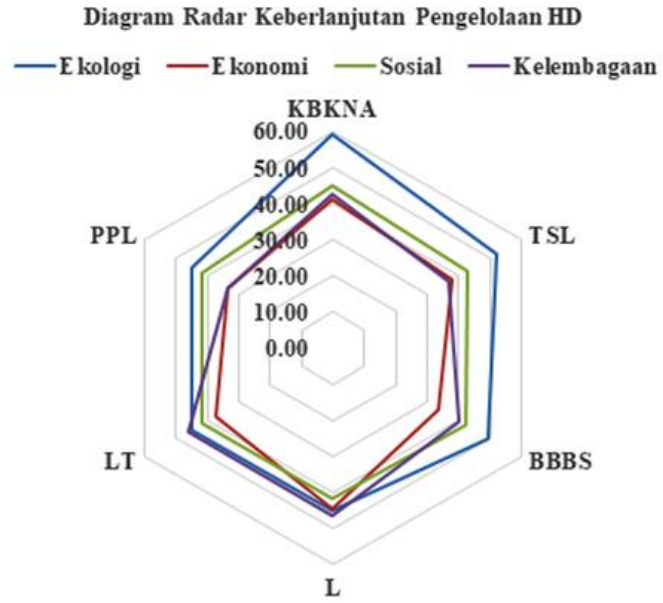


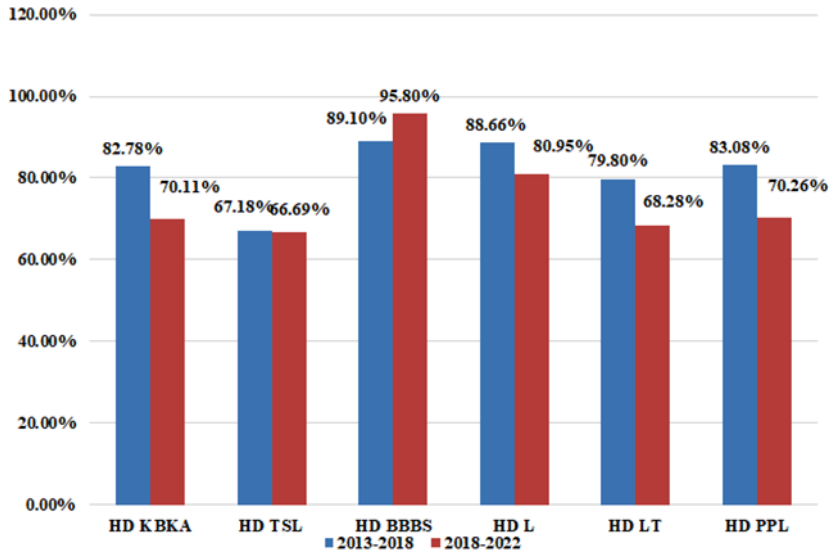
Figure 5 Radar diagram for the sustainability of HD

2. *Ecological Dimension*

Ecological dimension sustainability index of all HDs fall within less sustainable category (scored <50). On the other hand, HD KBKNA and HD TSL on the ecological dimension show a stand out value, having at 59.00 and 52.35, respectively. Some positive results might be contributed by well-performed management units, but also a progressive results of land cover and foret rehabilitation programmes. Having said so, these indicators are not automatically indicating good management practice. A well maintained forest cover in both HDs might be highly influcenced by its status as protected forest (HL) of which therefore halting destructive activities. In the other HDs, forest covers are continuesly declining due to agricultural expansion, estensivication programme of plantation commodities, and minor illegal logging activities. In more optimistic tones, the sustainablity of the other HDs are due to dynamic lang cover changes whether it's increasing and decreasie. For example, at HD L there was a reforestation programme between 2020 and 2021 with main aim was to regain forest cover in 300 hectares of forest land for the sake of climate change mitigation but also improving the quality of clean water supply in the region (Vita 2021).

3. ***Economic Dimension***

In general, all HDs have <50 score for sustainability index. This might be results of lack of venture capitals of HD management units that lead the lack of enterpreuner initiatives. However, HD PPL with its Kelompok Usaha Perhutanan Sosial (KUPS) Pondok Madu Marinai has shown a potent economic development for their members. When self powered venture capitals of HD management units are lacking, they mostly relied on government grants that mostly limited in the amount and take longer time to access is of which cause a stagnant process of HD development. According to Laksemi (2019), main capitals of HD are human resource, infrastructure and physical, and monetary capitals. These capitals of course not under any single government authority, i.e. human resource capital is under the Ministry of Education, while accessibility to reach HD is under the authority of Ministry of Public Works. Also banking institutions play pivotal role in providing grant or loan for HD management units that will likely boost farmers income, wich currently at Rp 2-3 millions per month. At pre-operating phase of HD management unit, an economically potential is rattan production. However, lower price during the Covid 19 pandemic and precipitated by the distance of rattan location-further in the centre of the forest, have stopped this business. We recognized that lack of collective actions and creativity in mobilizing local resources are, i.e. halting further development of a proper tourism destionation. In brief, the following Table 7 shows current activities in HDs.



Note: HD KBKA: Kampung Baru Korong Nan Ampek; HD BBBS: Barung Balantai Selatan; HD TSL: Taratak Sungai Lundang; HD L: Lunang, HD LT: Lunang Tengah dan HD PPL: Pondok Parian Lunang.

Figure 6 Changes in land cover in the six HDs, source from analysis of Landsat 5 satellite imagery for 2013-2018 and Landsat 8 satellite imagery for 2018-2022 land cover changes

4. Social Dimension

Likewise economic dimension, our result in the social dimension indicates that the sutainability index of HDs scored <50. This low score might be affected by series of conflicts on resource management, utilization of forest produces, and work force or employment rate.

Conflict is an activity carried out by party(ies) to gain limited resources or values or authorities where the main objective of it is not merely gaining profits or benefits, but also to conquer other party(ies) through violate or inviolate ways (Ibrahim 2002). In general, conflict involves three aspects that are cognitive, situation and behavior (Arifandy dan Imam 2015). In this study, the context of conflict is more into HD management effectiveness, where competition amongst members of HD management unit could lead to uneffective and inefficient social forestry/ village forest mangement. Through this study we successfully record the source of conflits in HD management unit, as described in the following Table 8.

Apart from resources management and utilization, high work force but low employement rate have also caused lowered social dimension index. In all HDs, employment only available for few members of HD management unit. Therefore, positive social impact of the forest and it's resources have not yet been affecting all community members. Obviously, the Covid-19 has greatly halted any further development, which caused local and regional economic dipped (Putra *et al* 2021) that include development of HD.

5. Institutional Dimension

Similar to other two dimensions, sustainability index on institutional dimension has low value at <50. A low score of institutional dimension has strong linkage with current situation within the HD management units where the KUPSs of HDs have just been improved and during transition period of new committee members.

Planning and develoment strategy of HD institutional dimension that include strenghtening KUPS are crucial for successful HD management aspects: business development, forest management and environment sustainability. Compliance to national regulation (Minister Decree No. 9/2021) made HD management unit should establish: (1) comodity-based KUPS; (2) statutory and membership KUPS; (3) field training centre, (4) skill exchange and horizontal learning to other KUPS; (5) institutional capacity training; and (6) continuously improve the statute of KUPS into cooperation company or village-own enterprise. Unfortunately, all KUPSs in the study area are categorized as blue level, means that all have not running any businesses, do not produce any products, and are in very early stage of business development phase.

Table 7. Types of utilization and business, sources of funds and income distribution.

No	HD	Type of business utilization	Sources of business funds/capital	Income distribution
1	HD KBKNA	Rattan utilization	Loan	Become the rights of members or groups that run the business
2	HD TSL	Rattan utilization	Loan	Become the rights of members or groups that run the business
3	HD BBBS	Rattan utilization	Loan	Become the rights of members or groups that run the business
4	HD L	Utilization of coffee and rattan	Loan and government assistance	Become the rights of members or groups that run the business
5	HD LT	Rattan utilization	Loan	Become a member right
6	HD PPL	Utilization of rattan and honey cultivation	Loan and government assistance	Become the rights of members or groups that run the business

Table. 8 Sources/forms of conflict in the management of HD.

No	HD	Source/form of conflict
1	HD KBKNA	- Determination of area status - Conflict of interest in local political contestation
2	HD TSL	- Conflict of interest in local political contestation - Determination of area status
3	HD BBBS	Conflict of interest in local political contestation
4	HD L	- Illegal logging - Conflict of interest in local political contestation
5	HD LT	- Illegal logging - Conflict of interest in local political contestation
6	HD PPL	- Conflict of interest in local political contestation - The distribution of aid is not transparent

Proper assistance and guidance towards KUPS capacity development in all HDs should be of top priority. A study by Ekawati (2020) says that communities require appropriate assistance and guidance in order to help them growing towards an independent enterprise to ultimately reach the main goal of the social forestry (HD), which is people's prosperity, sustainable forest management and sustainable environment. Therefore, social forestry (HD) mentoring has an essential position in ensuring successful social forestry programmes. HD mentorships must include all aspects of social forestry, that are early stage and preparation mentorship, buisness development and forestry management mentorship, cooperation and collaboration mentorship, enterprise, market and funding management mentorship, knowledge management mentorship, and monitoring and evalution mentorship of which are very ideal requirements that in reality are very hard to achieve.

Some of known challenges are not only the enourmous size and magnitude of the conflicts of HDs but also the remoteness of the location. Community empowerment has multiple times been sounded by community leaders, government officers and practitioners. However, until unless the community themselves started to embrace the opportunity, the change within the community might not be happened (Wibisono 2009). In reality, this approach may not automatically emerge out of nowhere, there should be direct interaction between locals and external parties who act as local mentor (Nugraha 2009). KUPS improvement is not limited to a business process but also accompanying local people to gain their confident and ability to run their own enterprise.

The second indicator that influences the value of institutional dimension of the sustainability index is management transition. According to Suryaningsum (2008) organizational structure is a big portion of the entire human environment in the organization and those structures are really important for constraining and shaping behavior. Organizational structure is a behavior controller, any changes to the organizational structure are definitely intended as an effort to change behavior. Through changing the structure we are changing the specifications about who makes reports and to whom they should be given reports, about the number of levels in the hierarchy, about rights to work, about who should report directly. Therefore, the management of the organization in LPHD is changing the behavior and views of the management towards HD. Our result tells that any changes or transitions in the management of LPHD in the six HDs were taking place only when members/board members in the organizational structure of the LPHD passed away and were physically no longer able to carry out their duties as administrators. This is one of the weaknesses of the transitional management in the six HDs that is making progressive changes are less likely to happen.

6. Leveraging Indicators of Sustainability

The result of leverage analyses (Figure 7) shows that there are changes in the ordinate value for each criterion when one indicator at a time is removed. Leverage analyses also shows high sensitivity of the indicator (Pitcher dan Preikshot 2001; Kavanagh dan Pitcher 2004; Fauzi 2019).

On the ecological dimension, the two most influencing indicators on HD sustainability are land cover and forest rehabilitation, which is backed up by a study of ecological sustainability in Nibung Bay HD, Kubu Raya District, West Kalimantan (Wahyu et al. 2022). On the economic dimension, the most influencing indicators towards sustainability are sources of venture capital (self/ assisted/ loans) at 3.01% and utilization of tourism potential (plans/ operations/ development) at 2.75%. Some of potential development that can generally be conducted in social forestry (PS) areas are agroforestry, non-timber forest products (HHBK), ecotourism, and environmental services (Lestari 2017). On the social dimension, conflict in managing yield consumption (3.04%) and labor distribution (1.73%) are two indicators that most influencing the value of sustainability. Meanwhile, on the institutional dimension, the influencing indicators are the increase in institutional status of Social Forestry Enterprises and the comprehensiveness of the management plan (3.16%) as well as the management dynamics and transitions that are going well (2.52%).

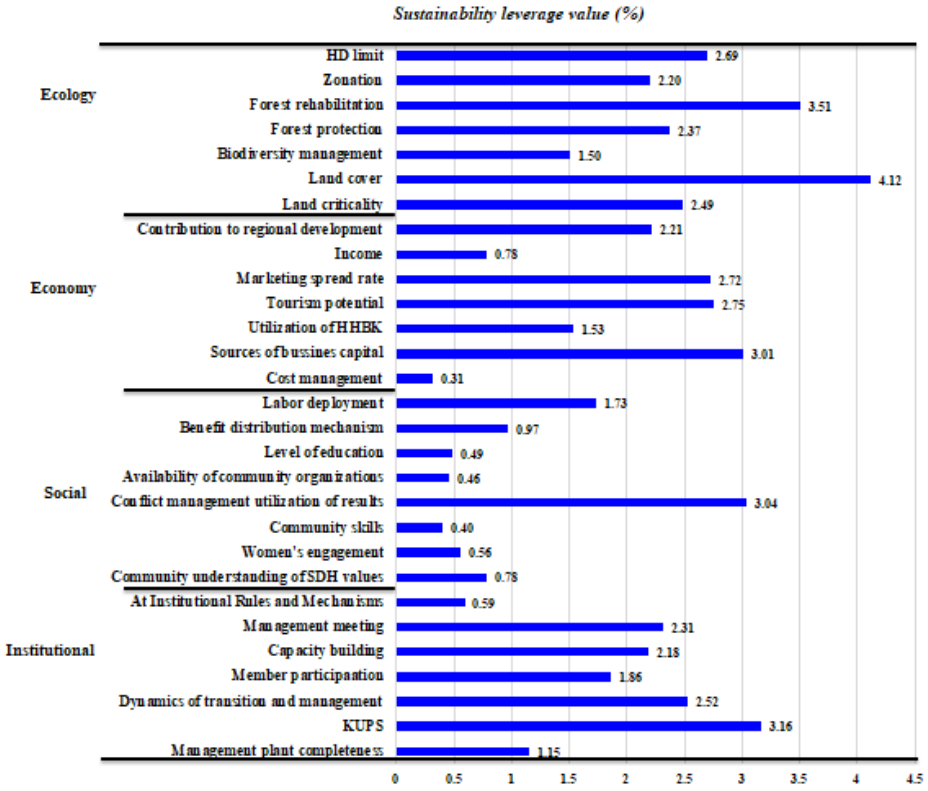


Figure 7 HD sustainability value leverage

CONCLUSION

The study shows the ecological dimension of Village Forest in Kampung Baru Korong Nan Ampek and Taratak Sungai Lundung are categorized as fairly sustainable. While the other four villages show less sustainable categories. From the social-economic and institutional dimensions, all villages indicated less sustainability. It is also found that the leverage indicators of sustainability such as land cover, forest rehabilitation, venture capital resources, tourism utilization, forest utilization, employment, and upgrading the status of Social Forestry Community Business as well as the management dynamic transition

REFERENCES

Aji GB, Rusida Y, Joko S, Andini DE, Tanjung S, Hasriani M. 2015. Sumbangan Hutan Kemasyarakatan dan Hutan Desa terhadap Pendapatan dan Pengurangan Kemiskinan. Pusat Penelitian Kependudukan LIPI dengan Kemitraan.

Arifandy MI, Sihaloho M. 2015. Efektivitas Pengelolaan Hutan Bersama Masyarakat Sebagai Resolusi Konflik Sumber Daya Hutan. Sodality: Jurnal Sosiologi Pedesaan. hal 147-158.

Ekawati S. (2014). Pengembangan KPH di Indonesia. In S. Ekawati dan B Hernowo (Eds.), Operasionalisasi Kesatuan Pengelolaan Hutan.

Ekawati S. 2020. Evaluasi Pemberdayaan Masyarakat Sekitar Hutan: Untuk Memastikan Tercapainya Tujuan Perhutanan Sosial. Yogyakarta: Kanisius.

Fauzi A. 2019. Teknik Analisis Keberlanjutan. Jakarta (ID). PT. Gramedia Pustaka Utama.

Fauzi A, Anna S. 2002. Evaluasi status keberlanjutan pembangunan perikanan: Aplikasi pendekatan Rapfish (studi kasus perairan pesisir DKI Jakarta). *Jurnal Pesisir dan Lautan Indonesia*. 4 (2): 36-49.

Ibrahim J. 2002. Sosiologi Pedesaan. Malang (ID): UMM Pres.

Kavanagh P, Pitcher TJ. 2004. *Implementing Microsoft Excel software for Rapfish: A technique for the rapid appraisal of fisheries status*. Vancouver (CA). Fisheries Centre Research Reports 12(2). The Fisheries Centre. University of British Columbia.

[KLHK]. Kementerian Lingkungan Hidup dan Kehutanan. 2020 Evaluasi Perhutanan Sosial di Provinsi Sumatera Barat Tahun 2020. Kementerian Lingkungan Hidup dan Kehutanan. Jakarta (ID) : KLHK.

[KLHK] Kementerian Lingkungan Hidup dan Kehutanan. 2020. Laporan Kinerja Direktorat Jenderal Perhutanan Sosial dan Kemitraan Lingkungan. KLHK. Jakarta (ID): KLHK.

[KLHK] Kementerian Lingkungan Hidup dan Kehutanan. 2021. Peraturan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia Nomor 9 Tahun 2021 tentang Pengelolaan Perhutanan Sosial. Jakarta (ID): KLHK.

Laksemi NPST, Sulistyawati E, Mulyaningrum. 2019. Perhutanan Sosial Berkelanjutan di Provinsi Bali (Studi Kasus di Hutan Desa Wanagiri). *Jurnal Sylva Lestari*, no.2, vol.7, 150-163. doi:10.23960/jsl27150-163.

Nugraha A. 2009. Pengembangan Masyarakat Pembangunan Melalui Pendampingan Sosial Dalam Konsep Pemberdayaan Di Bidang Ekonomi. *J Ekon Mod*. 5:10. http://ejournal.ukanjuruhan.ac.id.

Pitcher TJ, Preikshot D. 2001. RAPFISH: a rapid appraisal technique to evaluate the sustainability status of fisheries. *Fisheries Research*. 49: 255-270.

Pitcher TJ, Lam ME, Ainsworth C, Martindale A, Nakamura K, Perry RI, Ward T. 2013. Improvements to Rapfish: a rapid evaluation technique for fisheries integrating ecological and human dimensionsa. *Journal of Fish Biology*. 83: 865-889.

Putra YH, Sundawati L, Trison S. (2021). Dampak Sosial dan Ekonomi Pandemi Covid-19 pada Masyarakat Desa Sekitar Hutan KPH Purwakarta (Kasus: Desa Kutamanah) [IPB University]. In *IPB Repository UT-Forest Management*. http://repository.ipb.ac.id/handle/123456789/109550.

Sahide MAK, Fisher MR, Erbaugh JT, Intarini D, Dharmiasih W, Makmur M, Faturachmat F, Verheijen B, Maryudi A. 2020. The boom of social forestry policy and the bust of social forests in Indonesia: Developing and applying an access-exclusion framework to assess policy outcomes. Forest Policy and Economics. 120:1-18.

Suryaningsum S. 2008. Perspektif Struktur Organisasi (Tinjauan Sebagai Pengubah Perilaku). *Jurnal Pendidikan Akuntansi Indonesia*. Vol. VI. Hal. 63 – 74.

Vita F. 2021. Rehabilitasi Hutan Dan Lahan Di Nagari Lunang Sebuah Upaya Mencapai Tujuan Pembangunan Berkelanjutan (SDGs). Jakarta.

Wahyu A, Suharjito D, Darusman D, Syaufina L. 2022. Assessment of Village and Community Forest Sustainability: Evidence from the Local Level. *Int J Sustain Dev Plan*. 17(6):1753–1763. doi:10.18280/ijsdp.170609.

Wibisono EG. 2009. Pemberdayaan Kelompok Tani Studi Kasus di Desa Pangendan Kecamatan Rancakalong Kabupaten Sumadeng [Tesis]. Bogor(ID): Institut Pertanian Bogor.