

Indonesia's land reform: Implications for local livelihoods and climate change[☆]



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ABSTRACT

One of the main components of Indonesia's *Just Economy* policy is extensive and rapid land reform, which targets about 12% of the country's land area for redistribution to farmers and communities by 2019. Much of the reform is occurring on forest land. At the same time, the country has pledged a significant reduction of its greenhouse gas emissions by 2030, two thirds of which is to be achieved from forests. Hence agrarian reform potentially conflicts with emission reduction commitments. This research analyses how the redistribution of forests, with emphasis on the social forestry program, might affect people's livelihoods and Indonesia's capacity to deliver on its climate change commitments. With reference to Central Kalimantan province, we find that the land reform policy has increased the area distributed to local people through the streamlining of processes. However, ambitious targets and hurried distribution of land have posed significant challenges for processes and implementation. They result in partial understanding of the schemes, rights and responsibilities, inappropriate site allocation and types of forestland being distributed, and inadequate consideration for community capacity and local governance. Importantly, the resources allocated to grant these rights have not been accompanied by equal attention to foster subsequent actual land-based livelihood activities and forest protection. Hence the reform's potential to improve local livelihoods and contribute to climate change mitigation in Central Kalimantan is unlikely to be fully realized in the near future. We suggest that careful consideration be given to the processes of distribution, the type of forests being assigned, attention and support to foster implementation, and monitoring and enforcement of regulations.

1. Introduction

One of the main components of Indonesia's *Just Economy* policy is a significant land reform program (Amianti, 2017). The government intends to redistribute control over 21.7 million hectares of land, equivalent to about 12% of the entire nation's land area. Of that, 16.8 million hectares are forest land (KSP, 2017). This is a very large area of forest, slightly smaller than the forest area of Laos, and larger than that of Chile. The intended use and potential conversion of a forest area of that extent has significant and largely unexplored implications for both livelihood and environmental change.

The land reform program consists of two major components: lands

subject to agrarian reform (*Tanah Objek Reformasi Agraria*, TORA) and Social Forestry. The Agrarian reform program targets nine million hectares of land. It involves the distribution of land and formalization of land ownership, benefiting landless farmers or farmers with small landholdings. The Social Forestry (SF) program grants local communities usufruct and management rights to state forest lands, targeting 12.7 million hectares of forests by 2019.

These programs have the potential to hinder environmental reforms also ongoing in Indonesia. Indonesia is committed to reducing greenhouse gas emissions by 29% of its own accord, compared to the business as usual scenario by 2030, with an additional unclear reduction of between 9% and 12% with international support according to the

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Nationally Determined Contribution (NDC) submitted to the United Nations Framework Convention for Climate Change (Tacconi, 2018). About 60% of this reduction is to be achieved by reducing emissions from forests and peatland, which is the primary source of emissions (Republic of Indonesia, 2016). The redistribution of a large area of forest to landless/land poor farmers has the potential to negatively impact Indonesia's capacity to deliver on its NDC. Given that Indonesia is the largest global emitter of GHG from forest (PEACE, 2007), its climate commitments and the related effects of land reform have global relevance.

In this light, this paper addresses two uncertainties:

- To what extent might Indonesia's policy on the redistribution of forest access contribute to improving livelihoods?
- How might the redistribution of forest land affect Indonesia's capacity to deliver on its climate change commitments?

The paper is structured as follows. The following section presents research methods and a summary of literature on land reform, community forestry initiatives, and Indonesia's land management. Next is elaboration of Indonesia's land reform, focusing on the social forestry program. This is followed by research findings. Finally, the implications for livelihoods are discussed alongside those for climate change policy before concluding the paper.

2. Research methods

This section first describes the methods employed in the research, followed by literature review pertinent to the work.

2.1. Methods

The research comprised four main activities. First, we reviewed government documents, including policy instruments and regulations, and media and other articles on land reform and social forestry in Indonesia. This was done to analyze the regulatory framework and policies of the current reform, the processes involved in land distribution, and how they differ from previous practices.

Second, we conducted semi-structured interviews with twenty-six national policy makers, practitioners, and academics working on Indonesian land reform and social forestry. This practice proved useful in highlighting the processes driving the reform, and priorities and challenges in implementation. An initial list of key actors was identified, which was later expanded to include other relevant respondents using the snowball technique. Interviews were conducted in September and October 2017.

Third, in January 2018 we conducted focus group interviews with local communities participating in social forestry initiatives and one-on-one interviews with their representatives and other relevant local actors within four districts of Central Kalimantan province (Fig. 1) to assess their perception and implementation of the program. We interviewed ten groups of social forestry farmers and/or their representatives, provincial and district government officials, and NGOs. Focus group participants range from five to twenty people. Participants were farmers consisting of village administrators, village elders, and ordinary villagers. We also held subsequent interviews with some of the participating farmers to gain more in depth information.

We focused on Central Kalimantan because it has significant area of forests, large areas of peatland, and REDD+ initiatives, which are all relevant to emissions reductions from forest lands. In selecting research sites, we applied the following criteria: 1) coverage of the different types of social forestry schemes (see Table 1); 2) coverage of various forest categories; and 3) coverage of recently established and earlier initiatives. Non village actors were identified based on researchers' prior familiarity and experience with the area and using a snowball method. Qualitative analysis of interviews and FGDs were carried out

manually involving several iterative processes.

Fourth, using spatial analysis, we assessed the degree to which areas designated for social forestry and agrarian reform in our study region encompass various classes of forest cover and peatlands. In this way we explored the implications for the livelihood and environmental objectives of the social forestry and agrarian reform programs.

2.2. Literature review

This section summarizes relevant literature on rights, reform, social forestry, and land management in Indonesia.

2.2.1. Rights, reform and social forestry

Land reform typically involves the redistribution of land and/or regulatory changes that increase land access and/or tenure security. They are designed with the principal objective of improving livelihoods, particularly among the landless and/or the poor (Besley and Burgess, 2000). Such reforms are however also frequently cited as necessary to secure greater conservation in specific circumstances. For example: where new land rights promote new investments in tree cover or agricultural productivity (Reij et al., 2005), prevent open-access deforestation, or allow for payments-for-environmental services (Mahanty et al., 2013).

It is however not necessarily the case that stronger or more comprehensive land rights equate with greater conservation generally. Tenure security and its implications for the environment and livelihoods are influenced by the formal and informal specification of rights, their enforcement, as well as the perceptions about their security (Robinson et al., 2014). Indeed, upon reviewing the literature, Robinson et al., (2014, p. 283) conclude 'that tenure security matters, but whether its effect is positive or negative on forests depends on the assumptions and assumed context of the model'. Global reviews confirm these findings: Ojanen et al. (2017) finds that any of the four main property rights regimes (open access, public, private or community rights) can lead to deforestation, depending on local economic, environmental, political and social conditions. Lawry et al. (2017) reveal that land tenure recognition led to significant agricultural productivity and income gains, with stronger gains in Asia and Latin America and weaker effects in Africa.

Social forestry, often used interchangeably with community forestry, has now evolved into a more broadly encompassing term that includes "initiatives, sciences, policies, institutions and processes that are intended to increase the role of local people in governing and managing forest resources" (RECOFTC 2013:1). It is promoted on the premise that it can enhance sustainable forest use (Gilmour, 2016), reduce deforestation and improve forest quality (RECOFTC, 2013), strengthen rights over traditional land or resources (Molnar et al., 2011), increase local participation, improve local livelihoods (Gilmour, 2016; RECOFTC, 2013) and reduce rural poverty (Molnar et al., 2011; Bray et al., 2003). Community forestry currently covers 28% of forests in 62 countries, encompassing over 700 million hectares (Gilmour, 2016). Case studies do provide some promising outcomes of social forestry (Poudel et al., 2015; Rasolofoson et al., 2015; Lambrick et al., 2014; Bray et al., 2003) yet its general performance has been questioned. For example, a review by Bowler et al. (2012) found only limited positive environmental effects from community forestry schemes compared to forests managed by other actors, and no strong evidence of improved welfare.

2.2.2. Indonesia's land management: decentralization, community forestry, and contemporary land use policies and transitions in Indonesia

Social forestry's tenet of increasing local people's power and influence in forest management emphasizes devolution (Fisher et al., 2018; Gilmour, 2016; McDermott and Schreckenber, 2009). Community-based forest management began to gain attention in 1978 during the Eighth World Forestry Congress in Jakarta, but actual development was

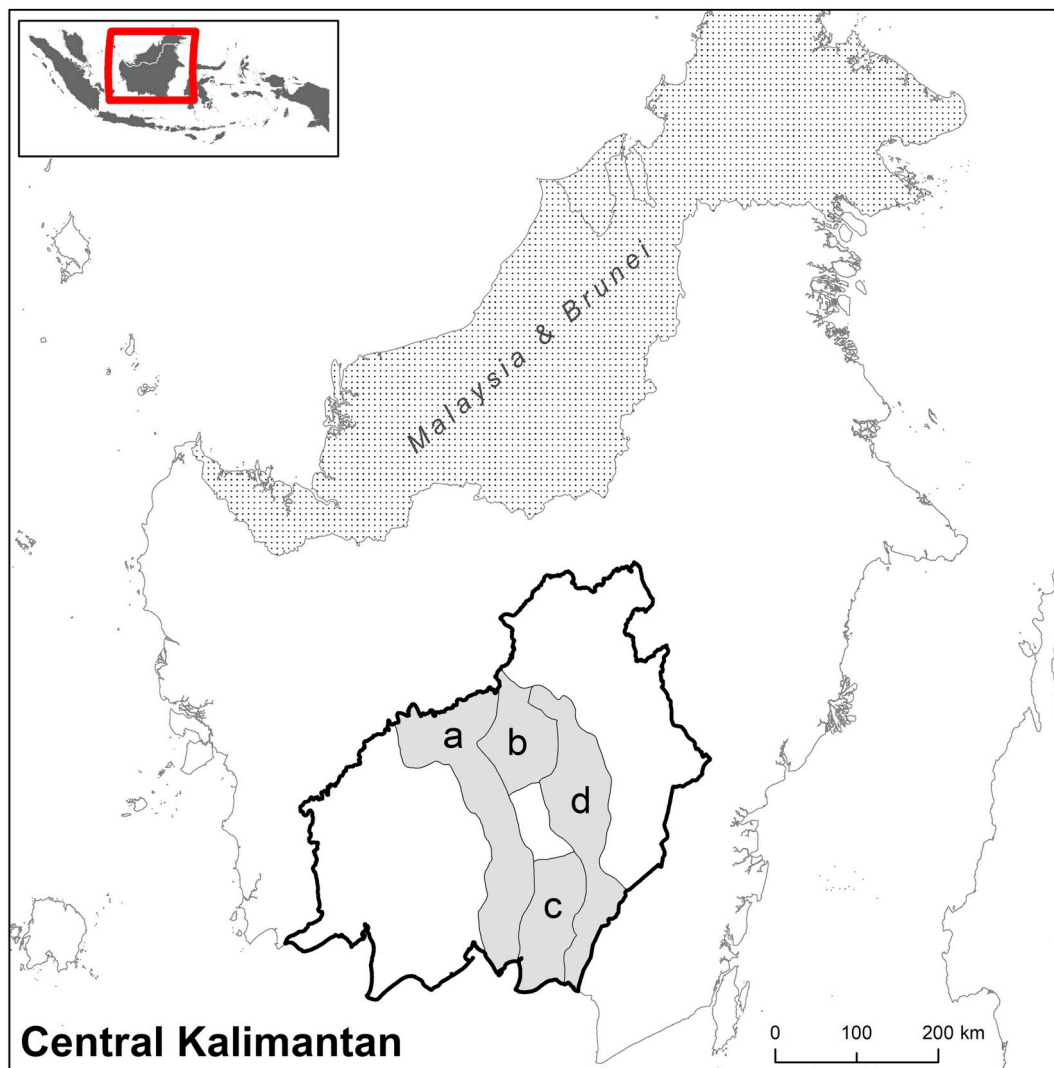


Fig. 1. Map of study area. Notes: Districts are as follows: (a) Katingan (b) Gunung Mas, (c) Pulang Pisau, (d) Kapuas.

minimal due to strong centralized governance. The then authoritarian regime successfully continued what had been initiated by the colonial rule in designating two-thirds of the country's land, irrespective of local and indigenous control, claims and contestations, as state forests (e.g., Colfer and Resosudarmo, 2002; Peluso and Vandergeest, 2001).

A breakthrough to devolve Indonesia's land management began shortly after the 1998 political upheaval when the country shifted to a more democratically decentralized regime. The change in governance offered formal decentralization on land management; albeit with the locus of authority on local (district) governments, rather than on communities (Barr et al., 2006; Resosudarmo, 2004). Devolving natural resource authority to lower levels was promoted based on the premise that 'locals know best', but with the critical caveat of effective accountability mechanisms (Ribot, 2004; Ribot and Agrawal, 1999). Failure in fulfilling this crucial element led to undesirable consequences of increased deforestation (Barr et al., 2006; Resosudarmo, 2007, 2004) and local government authority over forestland was subsequently withdrawn.

Forest management, however, continues to revolve around large-scale resource extraction and cultivation (e.g., Indrarto et al., 2012). As a result, in Java, local access to dwindling forest resources has become more limited (e.g., Maryudi and Krott, 2012). In the outer islands like Kalimantan, customary claims over state forests distributed to large-scale enterprises have ignited tenurial conflicts (e.g., Abram et al.,

2017).

The change in governance and the 1999 Forestry Law provided momentum for social forestry (e.g., Lindayati, 2002) and for assertions of indigenous rights to forests (Myers et al., 2017). Social forestry becomes a compromise for gaining community access to state forests (Fisher et al., 2018) although accepting it means acknowledging the State's legitimate authority over forests (Myers et al., 2017; Sikor and Lund, 2009), including over local and indigenous-claimed lands. At the same time, a 2012 Constitutional Court Decision strengthened the legal position of customary forests (*Hutan Adat*) by recognizing it as titled forests (*hutan hak*), thereby excluding it from state forests. Gaining social forestry permits in customary-claimed areas, however, may have implications on the processes of customary forests (*Hutan Adat*) recognition (Myers et al., 2017). Furthermore, the recent government policy of Forest Management Units responsible for administering forests at the local level also potentially complicates social forestry (Sahide et al., 2016).

Indonesia's social forestry program relinquishes management rights over state forests to local communities. While the triple aims of securing rights, enhanced livelihood, and forest conservation are central to social forestry (Maryudi et al., 2012), outcomes are contingent upon how communities can actually utilize their new found rights (Fisher et al., 2018). Having legal rights does not guarantee to benefit holders, rather, would hinge on the extent to which they have the power to attain

benefits from these rights (Ribot and Peluso, 2003; Ribot, 1998). One also needs to be cautious with the simplistic notion of a community in social forestry (Agrawal and Gibson, 1999) and communities' diverse socio-economic concerns (e.g., Li, 2002).

Past Social Forestry (SF) programs comprised of Community Forests (*Hutan Kemasyarakatan*, HKM), Village Forests (*Hutan Desa*, HD), community timber plantations (*Hutan Tanaman Rakyat*, HTR) and partnership arrangements between forest managers or forestry companies and rural communities. Despite various attempts and policy improvements over the years, development of these schemes has been far below targets (Table 2). Major impediments in mainstreaming SF in the past were lengthy licensing processes and issues with implementation (e.g., Maryudi, 2014).

Area designation and issuance of permits have been a major determinant in the development of past SF programs. For example, for an area to be designated for SF, a proposal would have had to pass 29 desks within the Ministry (Kemitraan, 2011). Similarly, the actual licensing by local authorities also involved many uncertainties and extended periods. There were also problems with implementation post-licensing, including participants' lack of capacity and capital (Nawir, 2013; Kemitraan, 2011), stringent or complicated requirements in managing the lands, and elite capture (Kemitraan, 2011).

Mixed results were reported of SF's livelihood and conservation outcomes (Siscawati et al., 2017; Edmunds and Wollenberg, 2003). Maryudi and Krott (2012) reported that SF reduced people's ability to benefit from forests, rather than improved it. Moeliono et al. (2015) reported increased individual usage of community forests (HD) in Sulawesi. Conversely, Santika et al. (2017) found reduced deforestation in HDs, with varied performance across types of forests. Others highlighted people's low motivation in planting timber species, associated with lack of forest ownership (in HTR) (Rohadi et al., 2016), and perceived insecure future benefits or dependence on agricultural crops (in HKM) (Nawir, 2013). Obidzinski and Dermawan (2010) concluded that limited tenure rights undermined HTR development, alongside limited financial feasibility.

The slow progress of both social forestry schemes and *Hutan Adat* recognition has contributed to continued skewed landholdings that result in persistent poverty, inequality, and conflicts. Hence the three objectives of the current effort to reinvigorate reform: alleviating poverty, narrowing the inequality gap, and addressing tenurial conflicts.

3. Indonesia's land reform: national policy and progress

The current, 'reinvigorated' reforms aim to provide legal recognition of land rights through two distinct means, namely (i) agrarian reform (TORA) and (ii) social forestry (SF). SF involves the distribution and formalization of community access to state forest lands through permits or partnership arrangements. Under the SF schemes, bound by certain regulations, grantees can use and manage forests for a specified period. Land within SF schemes continues to be under the purview of the Ministry of Environment and Forestry (MEF), i.e., the agency responsible for social forestry. SF prioritises sustainable forest management, in addition to livelihoods, and is thus distinguished from the agrarian reform (TORA) agenda.

TORA concerns the formalization of land ownership through land certification and redistribution to small-scale or landless farmers. With formal ownership, the TORA program provides the most extensive form of land rights that include alienation rights and more freedom in the use of the land. TORA, as the charge of Ministry of Agrarian Affairs and Spatial Planning (also the National Land Agency), is largely confined to non-forest (agricultural and other) lands. However, half of the land within the TORA scheme is to be released from the Forest Estate by the MEF, which therefore also plays a pivotal role in TORA.

3.1. Agrarian reform program (TORA)

The agrarian reform program (TORA) encompasses nine Mha of lands. It aims to certify 4.5 million hectares of lands informally controlled by individual farmers, as well as to redistribute an additional 4.1 million hectares of state forest lands and 0.4 million hectares of idle or abandoned lands under use rights.¹ In April 2017, the MEF issued Decree 180 on the Indicative Map of Forest Land Allocation for TORA, which identified 4.8 million hectares of the State Forest Estate that could be reallocated for TORA (Fig. S1). These forests comprise areas earmarked for release to crop plantations, areas of unproductive forests slated for conversion, potential areas for wet rice farming, existing rice paddy fields, dryland agriculture, and settlements.

3.2. Social forestry (SF)

Past challenges and current ambitious targets have prompted new strategies to expedite SF. The licensing processes now include streamlining procedures and regulations. Streamlining involves replacing a multitude of past regulations governing different SF with one umbrella regulation, namely MEF regulation 83/2016 on Social Forestry. The new decree regulates all current SF schemes.² To shorten the process of allocating permits, the MEF i) issued a national-wide indicative map for the allocation of SF schemes (*Peta Indikatif Area Perhutanan Sosial*, PIAPS); and ii) withdrew SF licensing authority from sub-national governments, effectively bypassing them in the process. The MEF also established a unit specifically responsible in overseeing SF applications and implementation. Additional strategies include the formation of SF acceleration working groups, development of an online system for SF applications, and the provision of multiple sources of funding.

The PIAPS – the set of 1: 250,000 scale maps that identify indicative areas of state forests for SF schemes – have become a particularly important new instrument. It serves as a reference for forest users in identifying areas proposed for SF. Revised every six months, the first PIAPS was introduced in January 2017 and identified 13,462,103 ha of forests for SF distributed across Production Forests, Protection Forests, peatland forests, and areas under existing timber plantation licenses required to be managed through partnership with communities. The PIAPS also stated that there were areas for customary forests and for community access in Conservation Forests, without specifying where they were in the maps. In September of the same year, the MEF issued the first revision, increasing the total area to 13,887,068 ha. Areas identified in PIAPS are prioritized for conflict resolution, and peatland and ecosystem restoration.³ Communities and farmer groups can now directly apply for SF in areas mapped in the PIAPS, although they can also propose areas outside PIAPS. Subject to administrative and on-the-ground physical verifications, the MEF then approves the application and issues an SF permit.

In past SF processes, administrative complexities often necessitated support and facilitation by a third party, such as NGOs. These were often carried out in an ad-hoc manner. In the current program, community support is institutionalized through the formation of SF acceleration working groups (*Pokja*). The national level SF working group, whose members comprise of MEF personnel, NGOs, and other practitioners, supports SF policy making processes. Provincial SF working groups consist of the local forestry authority and those outside the bureaucracy including NGOs. The tasks of the provincial SF working group encompass the entire process of SF: facilitating permit applications, assisting administrative and biophysical verifications, facilitating

¹ *Hak Guna Usaha*, use rights granted on state lands of 5 ha or above that can only be used for agriculture, animal husbandry or fishery.

² With the exception of Social Forestry Forest Use Permit, IPHPS (Table 1), as the scheme was introduced after the passage of this decree.

³ MEF Regulation 83/2016.

Table 1
Characteristic of Social Forestry Initiatives.

Features	Schemes					
	Village Forests (HD)	Community Forests (HKM)	Community Timber Plantations (HTR)	Partnership (Kemirauan)	Social Forestry Forest Use Permit (IPHPS)	Customary Forests (HA)
State forests or Titled forests	State Forests	State Forests	State Forests	State Forests	State Forests	Titled Forests
Type of rights	Usufruct/Management	Usufruct/Management	Usufruct/Management	Usufruct/Management	Usufruct/Management on Perhutani area	Communal ownership
Rights' legal document Function	Permit Protection and Production Forests	Permit Protection and Production Forests	Permit Production Forests	Cooperation Agreement Production, Protection, Conservation Forests	Permit Production and Protection Forests	Decree Production, Protection, Conservation Forests
Rights holders	Village institution representing village	Group or groups of people	Group of people or individuals	Unspecified – either group or individuals	Group(s) of farmers, cooperatives	Customary (<i>adat</i>) community
Period of rights Area under permit	35 years, possible extension No limit	35 years, possible extension No limit	35 years, possible extension Member: up to 15 Ha, Cooperatives: 5000 Ha	Unspecified timber utilization: 2–5 Ha; NTFP: no limit	35 years, possible extension Households: up to 2 Ha	No time limit No limit
Forest cover Permitted utilization	Unspecified NTFP, forest area, ES, timber in Production Forests	Unspecified NTFP, forest area, ES, timber in Production Forests	Unspecified timber (planted and from secondary regrowth), other forest products	Unspecified NTFP, forest area, ES, timber in Production Forests	≤ 10% standing stock NTFP, ES, planted timber in Production Forests	Unspecified NTFP, ES, timber in forests with production function
Rights & responsibilities	Non- transferrable; forest status and function alteration prohibited	Non- transferrable; forest status and function alteration prohibited	Non- transferrable; forest status and function alteration prohibited	N/A	Non- transferrable; forest status and function alteration prohibited	Forest status and function alteration prohibited
Specific prohibition	Oil palm prohibited; existing trees can be maintained up to 12 years.	Oil palm prohibited; existing trees can be maintained up to 12 years.	Oil palm prohibited; existing trees can be maintained up to 12 years.	Oil palm prohibited; existing trees can be maintained up to 12 years.	Not specified	Oil palm prohibited; existing trees can be maintained up to 12 years.
Priority objective or target communities	Conflict resolution, peatland and/or ecosystem restoration	Conflict resolution, peatland and ecosystem restoration	Conflict resolution, peatland and ecosystem restoration	Communities in or around forests under encumbered rights or forest manager; primary livelihood dependent on area	At least one member owning ≤0.5 Ha of land	Customary (<i>Adat</i>) communities
Benefit sharing mechanism	N/A	N/A	N/A	Specified in cooperation agreement	Regulated benefit sharing between Perhutani and communities	N/A

Note: ES environmental services; NTFP non-timber forest products.

the preparation of work and management plans, and assisting in the monitoring of implementation.

The institutionalization of relevant actors is expected to strengthen collaboration among them and facilitate exchange of information. Importantly, embracing donor-funded civil society formally helps overcome government's limited funds and resources. At the same time, it demonstrates a more inclusive and transparent approach and boosts SF's public acceptance. An online application system is currently being tested to expedite licensing and enhance transparency.

Financing for current SF schemes is provided through national and local government budgets, the Village Fund,⁴ the Forest and Land Rehabilitation Fund, and other sources. Funding for SF is low compared to program demands, however. In 2017, the SF budget was approximately USD 7.7 million, the third lowest among the 13 programs within MEF, compared to USD 115 million for TORA in the same year (Zuhriyah, 2017).

The new strategies and increased efforts have demonstrated results, at least in terms of area granted under SF. By September 2018, the government has distributed 1.9 million hectares of forests for SF (Table 2). Although still well below target, in three years the MEF has distributed over three times the area allocated to SF between 2007 and 2014.

An important and novel strategy is the inclusion of new schemes into the program to cater to SF proponents and achieve its target. In addition to the HKM, HD, HTR schemes, SF now includes partnership (*kemitraan*) and customary forests (*Hutan Adat*). While *kemitraan* was already used in the past as a strategy to reduce conflicts, it is now formally categorized as SF. The inclusion of customary forests is particularly noteworthy and follows from recent legal recognition of customary lands as being separate from the Forest Estate. Another more recent strategy was the issuance of Social Forestry Forest Use Permits (*Ijin Pemanfaatan Hutan Perhutanan Sosial*, IPHPS) to farmers' group(s) in Java.⁵

Following MEF regulation 83/2016, SF schemes are the granting of community access to state forests. They are manifested in usufruct and management rights through a permit for HKM, HD, and HTR (Table 1). In the case of *kemitraan*, rights of use are formalized not by a permit but through an agreement between the forest manager or the license holder (private or public forest entities) and communities. For customary forests, lands are ceded from the MEF to their customary owners. SF permits are granted over forest lands with no existing encumbered rights to user/farmer group(s), communities, or in the case of HTR, also to individuals.

The types of SF schemes planned in Conservation Forests are thus far limited to *kemitraan* (interview with a senior official in charge of Conservation Forests, October 2018). The government, however, has allowed large-scale activities in these forest categories, such as geothermal, suggesting potential demands for similar utilization for SF (Sahide et al., 2018).

Table 1 shows the different SF schemes and their respective foci. For instance, the primary purpose of Village Forests (HD) and Community Forests (HKM) is welfare improvement or community empowerment, while for Community Plantation Forests (HTR) is forest resource sustainability, hence timber production. Management and use of land under these permits (HD, HKM, HTR) are government-regulated and are set out in work plans endorsed by designated authorities.

⁴ Each year the Central government allocates a specific amount of funds to every village across Indonesia. The Fund is to support village development tailored to their own needs and priorities.

⁵ This scheme initially stirred controversies because it involved issuance of permits over state forest lands under the active management of the SOE Perhutani. The MEF nevertheless continues with this scheme, as lands and candidate recipients in Java are more readily identified compared to their counterparts in the outer islands and will help boost targets.

Permissible activities are defined by the type/functions of the forests encompassed. In Protection Forests, activities are restricted to area utilization, use of forests' environmental services, and NTFP collection, while in Production Forests timber extraction and planting are also allowed. A critical feature of the SF scheme is the prohibition of altering the (legal) status function of licensed forests. Thus, forests designated as Protection Forests must remain protected and, consequently, will have limited use options. This feature serves as an institutional 'insurance policy' for forest conservation objectives.

Although the SF scheme has been extended to so-called titled forests, which are distinct from the official State Forests, it struggles to encompass such forests in practice. Titled forests (i.e., forests encumbered with rights) comprise of customary forests (*Hutan Adat*) and individually or privately-owned forests. Customary forests are granted to recognized customary law communities through a set of procedures, which include the demonstration of continuing customary features on the part of the community. Acquiring such formal customary recognition, in the form of a local regulation, has proven onerous and problematic for many communities. Very few customary forests have therefore been recognized as titled forests to date.

4. Findings: social forestry in Central Kalimantan

Here we present how the SF program is implemented in Central Kalimantan. The province has demonstrated significant progress under the reinvigorated SF program, reaching 7.5% of its official target for 2019. Although this figure seems low, it is much higher than what was achieved in past SF programs.

Until March 2018, only three of the five SF schemes had been granted in Central Kalimantan (HDs, HKMs, and HTRs) (See Table 3). As the government had only begun to intensify the program in 2016, most of these initiatives were relatively new, although some HDs were established earlier under the previous administration. Partnership (*kemitraan*) has not been established and no customary forests as titled forests have yet been recognized. The absence of both schemes reflect the processes involved: *kemitraan* often necessitated active initiation from a company or local government, while the *Hutan Adat* involves the arduous processes that include a local government regulation recognizing the customary communities and their area.

4.1. Forestry governance and agents

Interviews with local actors suggest that forestry governance and the actors involved affect SF processes and implementation in the province. Two major government or government-led structures have been established for SF. The first is the office of Social Forestry and Environmental Partnership (BPSKL), an arm of the MEF in the regions. The second is the SF Working Group led by the Provincial Forestry Service. The BPSKL oversees SF, leaving the forestry service with little decision-making authority over SF. There is only one unit responsible for all five provinces of Kalimantan; it is located in the capital of the adjacent province of South Kalimantan, thus operating some 225 km from the capital of Central Kalimantan. The dominant role of the Central Government in SF, with insufficient capacity to cover large areas, rather than the effective mobilization of the Provincial Forestry Service who are physically closer to the communities, hinders effective SF processes, including site verifications and monitoring.

Despite significant responsibilities as the lead agency in the SF working group, provincial forestry budget allocation for SF is low (interviews with provincial forestry officials, January 2018). Furthermore, limited authority restricts the capacity of the Provincial Forestry Service to engage more meaningfully in SF. Often feeling sidelined by the BPSKL, they only take part in activities initiated by the former or carried out minimal activities such as dissemination of information, referred to as *sosialisasi*. The structure that does not align responsibility with authority and resources can undermine SF's effectiveness on the

Table 2
Progress of Social Forestry as of September 2018.

Scheme	Area under Permit/MOU (Hectares)				
	2007–2014	2015	2016	2017	2018 (September)
	(hectares)				
Village Forests (HD)	78,072	63,587	96,285	440,920	998,944
Community Forests (HKM)	153,725	20,945	2465	124,413	466,162
Community Plantations (HTR)	198,594	2815	14,131	33,444	291,305
Partnership (<i>Kemitraan</i>) – including IPHPS	18,712	17,889	24,468	33,307	143,147
Customary Forests (<i>Hutan Adat</i>)			7950	3342	17,323
Reserved for Customary Forests			5172		10,627
Total Area	449,104	105,237	145,300/150,472	635,426	1,916,881 1,921,508

Numbers in italics = area reserved.

Source: MEF, 2017; 2018; MEF's performance report for 2016 and 2017.

Table 3
Social forestry in Central Kalimantan as of March 2018.

Scheme	Area under Permit or partnership agreement (Hectares)					
	2007–2014	2015	2016	2017	2018	2018 (March)
Village Forests (HD)	16,245	14,676	17,074	1678	43,165	92,838
Community Forests (HKM)	–	–	3180	6851	–	10,031
Community Plantations (HTR)	2075	–	11,803	11,393	720	25,991
Partnership (<i>Kemitraan</i>)	–	–	–	–	–	–
Customary Forests (<i>Hutan Adat</i>)	–	–	–	–	–	–
Total Area	18,320	14,676	32,057	19,922	43,885	128,860
PIAPS – revision1	1,702,386					

Source: MEF (2018).

ground.

Non-governmental actors working with forest communities are prominent in Central Kalimantan. NGOs play a large role in community facilitation, which is essential in all schemes studied. They include disseminating information about SF, assisting communities in obtaining critical data such as PIAPS, providing support in the preparation of required documents and area maps, and in submitting applications. In effect, NGOs fill the void that would have been the role of the Provincial Forestry Service. This highlights a potential neglect of communities not well serviced by local NGOs.

4.2. Motivations for participating in SF

FGDs and site-level interviews reveal that communities' motivations for participating in SF are generally enhanced tenure, conservation, and economic benefits. For instance, study communities originally intending to secure customary forests ultimately settled for the next best opportunity, in this case Village Forests and HKM (Table 4), due to complexities and uncertainties that the former entailed. Communities also sought SF permits to protect forests by precluding their legal use, incursion or conversion by others. This is illustrated by one HKM license granted over 4000 ha of forests previously proposed for conversion to mining. The farmers' groups holding the license are now in a stronger position to prevent the adjacent oil palm plantation from extending into their HKM area.

Similarly, another motivation for SF participation is to gain legality over state forest areas where locals have already undertaken activities and claim as their lands. Some farmers have planted small plots of fast-growing tree species, *sengon* (*Paraserinthes Falcataria*) in areas under HTR even prior to obtaining their permit. The HTR permit thus provides them with *post-facto* legality via *de jure* land rights. In recent years *sengon* planting has gained popularity due to Java-based market demand and the falling prices of rubber, the commodity which many

communities have historically depended on for their livelihood. In general, communities applying for HTR are often driven primarily by economic gains, while those participating in HDM or HKM, although keen for the economic benefits, exhibit a greater concern for forest protection.

Many participants view that SF is just another government project (Table 4). Here the economic motivation for participating in the scheme is more apparent, with high expectations of some form of government support.

4.3. SF implementation and the promise for community revenues

FGDs, interviews with participating farmers, and field observations suggest that there are several challenges in SF implementation after permits are granted with potential implications on livelihoods/income and forest management that affect climate change mitigation. They are i) limited understanding of the schemes, rights and responsibilities; ii) inaccessibility of sites; iii) lack of resources and capacity; and iv) weak governance within the community or farmers' groups.

SF participants' understanding of the particular schemes are diverse among group members and between groups. Some members, sometimes including the groups' or community leaders, appear to have limited understanding of the permit, what it entails, and are unaware of SF regulations governing the permit. Consequently, there is a lack of understanding of rights and responsibilities attached to the permit. In Village Forests (HD), some members participate simply because other villagers do or as village residents automatically become a member of the scheme. FGDs and interviews suggest that not all members of the HD are therefore active or support the HD; some are even sceptical of its benefits.

Activities subsequent to the acquisition of a permit are visibly limited due to the many challenges facing permit holders. FGDs, interviews and visits to the SF sites reveal similar major constraints across all of the

Table 4
Community perceptions, aspirations, and implementation of SF schemes in study sites.

Scheme; District; Permit date	Forest Category	Licensing process: Proposal Initiation (I); Enabling condition (E)	Perception: Knowledge of scheme, rights and responsibilities (K); Motivations (M); Hopes and Expectations (H)	State of implementation/ac-tivities (I); Planned activities (P)	Main Challenges
HKM; Gunung Mas, 2016	Protection Forests	I: farmers' groups E: information from district forestry service	K: limited or incorrect; M: economic benefit; H: investor/third party support	I: No activities; P: fast growing timber species and intra-cropping	Distance & access to site, physical boundaries unknown to permit holders, lack of capital
HKM; Katingan; 2017	Conversion Production Forests	I: farmers' groups; E: NGO facilitation and information from provincial and district forestry service, strong shared goals among 5 village participants	K: good due to interactions with conservation NGOs; M: forest protection, compromise in lieu of <i>Hutan Adat</i> ; H: economic benefit a later priority, SF limited income potential	I: survey of potentials; P: ecotourism, boundary marking, resin trees, rubber medicinal plants, area monitoring	Distance and access to site, capital/ fundings, some area overlapping with or have been cleared by adjacent oil palm plantation
HD; Kapuas; 2015	Protection Forests	I: Recent past REDD+ projects intervention activities E: Recent past REDD+ project activities	K: good due to recent past external project; M: Economic benefit from reforestation project; H: new external project with economic benefit for villagers (e.g., providing labor)	I: No activities, recent past reforestation project ceased and entire vegetation burned; P: fish ponds, pine apple, beekeeping, agroforestry	Access to site, capital, lack of community ownership, government canal blocking in HD area without knowledge and consent of HD
HD; Pulang Pisau; 2013	Protection Forests	I: village community members E: NGO facilitation	K: good due to NGO facilitation and programs; M: forest protection, a compromise in lieu of <i>Hutan Adat</i> ; H: increased support for HD activities and protection	I: limited monitoring activities, some tree planting (regreening); P: ecotourism	Access to site, existing access through waterways further hampered by canal blocking of peatland project, costs of forest monitoring
HD; Pulang Pisau; 2013	Protection Forests	I: village community E: information from the District Forestry Service and local NGO facilitation	K: good due to NGO facilitation and programs; M: forest protection, secure tenure—a compromise in lieu of <i>Hutan Adat</i> recognition; H: improved livelihoods that would foster forest protection	I: limited monitoring, some livelihood activities (rubber and cow rearing) and disseminating seeds of NTFPs and native species for reforestation; P: build monitoring facilities, request support from peatland project, plant <i>serpong</i> for buffer with adjacent HTR	Access to site, elite capture, lack of capital, diverse perception of HD's benefits and support within the village, limited allowable activities in HD
HD; Pulang Pisau, 2016	Production Forests/ Limited Production-ion Forests	I: members of village community; E: NGO facilitation and strong information network with district government	K: good understanding due to NGO facilitation and strong network of HD leaders; M: rights to manage forests/tenure, forest protection; H: promised government support realized, revenues to enable HD activities and benefit villagers	I: monitoring/patrol, some initial boundary marking, built visitor lodge; P: complete boundary marking, ecotourism	Participation and support divided among villagers, some sceptical of HD, few active members, lack of capital, lack of government support
HTR; Pulang Pisau, 2016	Production Forests	I: District government; E: District government; area proposed/mapped out by local government; speedy licensing process	K: partial, perceived as a top down project; M: timber revenues, perceived guaranteed government support and community-company partnership, legality for <i>de facto</i> use of forest land; H: a benefit-sharing arrangement where a company conducts entire plantation activities (land clearing to harvesting), paid labor in HTR, compensation for claimed plots	I: No HTR activities due to delayed community-company partnership but individual activities in claimed plots continue; beekeeping failed; P: partnership realized, claimed plots mapped (for compensation).	Access to site, lack of capital, elite capture, delays in community-company partnership, unclear tenure as some areas within HTR are being used and claimed by members of the community, lack of knowledge to utilize livelihood support
HTR; Pulang Pisau; 2017	Limited Production Forests	I: District government; E: District government; area proposed/mapped out by local government; speedy licensing process	K: partial, perceived as a top down project; M: timber revenues, perceived guaranteed government support and community-company partnership, legality for <i>de facto</i> use of forest land; H: a benefit-sharing arrangement where a company conducts all plantation activities from land clearing to harvesting, paid labor in HTR, compensation for claimed plots	I: No HTR activities due to delayed community-company partnership but individual activities in claimed plots continue; P: partnership realized, claimed plots mapped (for compensation).	Access to site, lack of capital, delays in community-company partnership, unclear tenure as some areas within HTR are being used and claimed by members of the community.
HTR; Pulang Pisau; 2017	Limited Production Forests	I: District government; E: District government; area proposed/mapped out by local government; speedy licensing process	K: partial, perceived as a top down project; M: timber revenues, perceived guaranteed government support and community-company partnership, legality for <i>de facto</i> use of forest land; H: a benefit-sharing arrangement where a company conducts all plantation activities from land clearing to harvesting, paid labor in HTR, compensation for claimed plots	I: No HTR activities due to delayed community-company partnership but individual activities in claimed plots continue; P: partnership realized, claimed plots mapped (for compensation).	Lack of capital, elite capture, delays in community-company partnership, unclear tenure as some areas within HTR are being used and claimed by members of the community.

(continued on next page)

Table 4 (continued)

Scheme; District; Permit date	Forest Category	Licensing process: Proposal Initiation (I); Enabling condition (E)	Perception: Knowledge of scheme, rights and responsibilities (K); Motivations (M); Hopes and Expectations (H)	State of implementation/activities (I); Planned activities (P)	Main Challenges
HTR; Pulauang Pisau; 2017	Limited Production Forests	I: District government; E: District government; area proposed/mapped out by local government; speedy licensing process	K: partial, perceived as a top down project; M: timber revenues, perceived guaranteed government support and community-company partnership, legality for <i>de facto</i> use of forest land; H: a benefit-sharing arrangement where a company conducts all plantation activities from land clearing to harvesting, paid labor in HTR, compensation for claimed plots	I: No HTR activities due to delayed community-company partnership but individual activities in claimed plots continue; P: partnership realized, claimed plots mapped (for compensation).	Access to site, lack of capital, delays in community-company partnership, unclear tenure as some areas within HTR are being used and claimed by members of the community.

ten study sites: inaccessibility of areas under the permit and lack of capital. Some of the sites are distant to settlements and can only be reached with motorized canoes, which is hampered or not possible during the dry season, or motorcycles. In other cases it is simply difficult to reach the site. In one case, access to the site through waterways has become more difficult due to the recent canal blocking as part of peatland restoration in the area. Inaccessibility thus constrains community revenue generation and protection activities.

Lack of capital also results in minimal activities on the ground, affecting all study sites. Communities often do not even have adequate resources to carry out basic initial activities such as installing boundary markers. In addition to inadequate capital, data on the exact coordinates of the area under the permit that would enable accurate installment of boundary markers are often inaccessible to SF permit holders. Physical boundary markers are important as they show tenureship and are erected to prevent unwanted users. The MEF does provide a one-time support of an equivalent to 4000 USD for each site; however, this is not only inadequate, but it is often not well targeted to support the SF's implementation effectively. Moreover, governance is an issue. In one HD, management of government's support is not transparent, causing internal friction. In this case, at the discretion of the village institution official, the one-off government support has been used to purchase livestock, benefitting a few.

Livelihood opportunities from schemes situated in Protection Forests are limited as only certain activities (e.g., NTFP collection, environmental services) are permitted. Proceeds from NTFPs are generally lower than from timber and initiatives that monetize provisions of environmental services in Indonesia are still at its infancy. Four of our study sites are located in Protection Forests. One HD aims for ecotourism and with support from an NGO, the Village Fund, and active members' own resources, has successfully built a modest visitor accommodation. However, the distance from the capital of Palangkaraya or a nearby town and the relatively small size of the protected area can undermine this goal.

SF can incur costs to communities. Active members of the same HD above have been funding monitoring costs out of their own pockets. Adjacent to this HD is a Production Conversion Forest where small-scale illegal logging occurs that easily transgresses into the HD, necessitating frequent monitoring. This self-financing effort is unsustainable and an income stream or external support will ultimately be needed to sustain it. Because activities are slow – which some members of the HD attributed to lack of government assistance – members who were initially supportive of the HD have started to question it and those who were unsupportive to begin with have become even more sceptical of its worth.

Participating communities can obtain outright economic benefits where there are projects in their area that involve them directly. This was the case in one study HD, where paid community involvement in a reforestation project was a significant motivating factor to apply for the HD in the first place (Table 4). At the time, villagers supplied labor and seedlings for the project. The community interviewed expressed their hope for a similar project in their HD area so they can again obtain monetary benefits.

The government realises that SF implementation goes beyond the mere distribution of permits (interviews with various MEF officials, October 2017) and so offers options for financing its implementation. This includes the channelling of the large amounts of funding from the Reforestation Fund, managed by the Public Service Agency for Forest Development Financing, in the form of revolving loans. Although funds are available, distribution has been slow (interview with MEF senior official in charge of Forest Development Financing, October 2017 and unpublished data, MEF). Even though the primary objective of the loan provision is not for profit, this agency is nevertheless accountable for the funds. Thus, they prioritize potentially profitable SF schemes or those that can secure enough revenues to repay the loan.

In Central Kalimantan, the agency focuses on HTR development,

yielding timber revenues to repay the loan. Thus, schemes attending forest protection, arguably with less revenue potential, have lesser opportunities to secure funding. Even within HTR schemes, the agency is keener to finance via a partnership with a timber company, where the company would act as the guarantor.

In reality, the development of HTR also faces significant challenges that have implications on expected economic returns. All of the four HTRs studied, fostered by the district government, are establishing a partnership with a timber company. The farmer groups would 'sub-contract' their land to establish a timber plantation and the proceeds would then be shared between the company and the farmers. There are significant obstacles to such partnerships, however:

- **Viability:** The relatively small size of the HTR areas may not be considered financially viable. Also, difficult access results in higher operational costs.
- **Tenure:** The HTR permit legalizes community access to state forests. Over the area under HTR permits, however, there are (already) many land documents called *Surat Pernyataan Tanah* (SP). SPs are documents signed by the village head as proof that a plot of land is actively managed by an individual. Although SPs are not recognized as a legal document and cannot be used as a basis for certification, communities claim these plots as theirs. Indeed, *sengon* are already planted in the relatively more accessible areas within the HTR showing active proof of land management and hence ownership (Resosudarmo et al., 2014). *De facto* and *de jure* control of land complicates partnership arrangements and raises their costs, as they entail arduous tenure verification and payments of compensation, thus deterring partnerships. Moreover, communities reported that the company is purchasing lands to establish their own plantation themselves, by doing so placing less priority on resolving matters to pursue partnership with HTRs.

The actual condition of the land also emerges as one challenge to fund HTR. The Public Service Agency for Forest Development Financing reportedly puts their considerations on hold because, upon verification on the ground, found that some area of the SF schemes is situated in deep peat (interview with a forestry extension officer, January 2018). Our spatial analysis corroborates this, discussed in the next section.

The HTR permits under study were a top down, rather than a bottom up product, on display for the President to distribute. The process was rushed where communities were requested to form farmers' groups within only several days. As a result, the communities perceived it as a government program and by participating, they are showing support for the program. Consequently, they expect instant implementation via government support, beyond the mere issuance of a permit. Although some farmers did initiate small plots in the more accessible areas, prior and after obtaining the permits, they were adamant that they did not have the resources to clear and work the entire area of the HTR and were expecting assistance, such as through a company-community partnership. Farmer groups' incapacity to work the HTR is exacerbated by the strictly enforced ban of using fires to clear land, a cheaper and easier traditionally used method but a significant contributor to GHG emissions.

4.4. Allocation of SF schemes in Central Kalimantan and emission reductions potential

Indonesia's Third National Communication to UNFCCC explicitly states SF as one of the country's core mitigation strategies in the forestry sector (Republic of Indonesia, 2017). Notably, HKM, HD, and partnership (*kemitraan*) schemes are to deliver 20% of the emissions reduction target from avoided deforestation and degradation. The provision of legal access to communities encroaching on state forests, along with economic enhancement and increased forest protection awareness, are

expected to address drivers of deforestation⁶ (Republic of Indonesia, 2017). Improvement of forest plantation businesses, which include HTR, is expected to secure an additional 21% of emissions reduction from avoided deforestation and degradation. The document also recognizes that all of these schemes provide carbon sink enhancement, further emphasizing the expected role of SF in the country's mitigation efforts.

Our spatial analysis show that a significant share of area under PIAPS in the four study districts is peatland or intact forests, entailing major implications for emissions given land-use change or conservation. Analysis on the PIAPS maps (Fig. S1) shows 688,017 ha of various land conditions/uses and soil types distributed or reserved for SF in the four study districts, encompassing all four forest functions. Peat soils comprise nearly half (45.2%) of the entire area within the PIAPS (Table 5), indicating major potential for emissions depending on underlying forest-use designations and peat depths.

Nearly half (42.3%) of the total area in PIAPS are intact forests, but only a quarter of this (or 10% of the total area under PIAPS) (Table 5) are designated as Protection Forests and hence to be protected. Half of the intact forests are in Production Forests that can be managed for timber production or plantations while the remaining (9% of total PIAPS or nearly a quarter of intact forest) are in Production Conversion Forests.

The significant area of peatlands in PIAPS, including deep peats, raises the prospects of significant emissions. Deep peat soils > 3 m account for more than half of all peat soils or 27% of the total PIAPS area (Table 5). An additional one third of all PIAPS peatlands areas are 0.5–3 m deep (Table 5), accounting for 16% of the total PIAPS area. Government regulation⁷ prohibits the clearing and cultivation of peat forests of 3 m or above, but there are no restrictions for cultivation of peatland below 3 m deep.

PIAPS also allocates a notable area of intact deep peat forests in Protection Forests, suggesting a high potential for emissions avoidance if such forests were to remain protected. Nearly half of intact forests in PIAPS of the four study districts is peatland, and over half of this intact-forest area (11.8% of the total PIAPS) is deep peat > 3 m. Most (i.e., 17.9% of total area under PIAPS) of deep peat of over 3 m is in Protection Forests, 8.5% of which is intact forest.

A relatively small but not insignificant share of PIAPS in the four study districts under Production Forests are of deep peat. Of the Production Forests in the four districts allocated or reserved for SF, 17.92% is peat of various depths, with 62,787 ha peat above 3 m (Table 5). Three percent (or 20,355 ha) of the total PIAPS in Production Forests are intact forest and deep peat above 3 m. Maintaining such forests as such would therefore avoid significant emissions.

However, avoiding emissions in Production Forests licensed for SF is highly contingent on on-the-ground practices. Production Forests can be cleared for timber plantation, for example. Current regulations do not specify the condition (carbon stock) of natural forest cover that can be cleared to this end, nor the types of superseding planted tree cover. Despite the prohibition of oil palm, the practice of converting intact natural forest to fast-growing tree species would cause emissions in many instances (e.g., Verchot et al., 2010). Without effective monitoring and strict enforcement of regulations, even these strictly regulated peat forests face risks of being cleared, drained, and replaced with fast-growing plantations.

It is important to emphasize that PIAPS is indicative, so areas under the PIAPS are to be verified prior to their actual designation for SF. However, FGDs and interviews with local communities and field observations suggest that at least some areas under HTR permits are of

⁶ Despite these assumptions, we recognize that large-scale conversion is an important driving force of deforestation.

⁷ Government Regulation 57/2016 on the Protection and Management of Peatlands.

Table 5
Social forestry area allocation and indicative areas according to PIAPS revision 1 in four study districts.

Forest Category	Soil type	Bare/ grasslands	Agric and Plantation	Forest regrowth & Agroforestry	Intact Forests
Protection Forests	Not peat	0.0%	0.1%	0.3%	2.0%
	< 50 cm	0.0%	0.0%	0.0%	0.0%
	50-300 cm	0.2%	0.5%	0.9%	0.4%
	> 300 cm	0.4%	1.2%	7.8%	8.5%
<i>Sub-total</i>		0.7%	1.8%	8.9%	10.9%
Production Forests	Not peat	4.3%	5.8%	16.5%	16.7%
	< 50 cm	0.1%	0.1%	0.1%	0.9%
	50-300 cm	2.2%	1.3%	2.7%	1.4%
	> 300 cm	0.8%	2.1%	3.3%	3.0%
<i>Sub-total</i>		7.4%	9.3%	22.6%	21.9%
Conversion Production Forests	Not peat	1.2%	0.5%	2.1%	5.2%
	< 50 cm	0.0%	0.0%	0.0%	0.1%
	50-300 cm	0.4%	0.3%	1.9%	3.8%
	> 300 cm	0.1%	0.1%	0.0%	0.4%
<i>Sub-total</i>		1.7%	0.9%	4.1%	9.4%
Nature/ Protected Reserves	Not peat	0.0%	0.0%	0.0%	0.0%
	< 50 cm	0.0%	0.0%	0.0%	0.0%
	50-300 cm	0.0%	0.0%	0.0%	0.0%
	> 300 cm	0.0%	0.0%	0.0%	0.0%
<i>Sub-total</i>		0.0%	0.0%	0.1%	0.1%
Areas for Other Uses	Not peat	0.0%	0.0%	0.1%	0.0%
	< 50 cm	0.0%	0.0%	0.0%	0.0%
	50-300 cm	0.0%	0.0%	0.0%	0.0%
	> 300 cm	0.0%	0.0%	0.0%	0.0%
<i>Sub-total</i>		0.0%	0.0%	0.2%	0.0%
<i>Total</i>		9.8%	12.1%	35.9%	42.3%

Source: Forest category as per Decree of the Minister of Forestry SK.529/Menhut-II/2012. Soil type / peat depth as per the Ministry of Agriculture (Ritung et al., 2011; BAPPENAS, 2013); Land cover as per Miettinen et al. (2016). See Supplementary Materials for details and data descriptions.

deep peat and will be developed as *sengon* plantations. This fast growing species cannot thrive on deep peat, necessitating peat drainage. The *sengon* then are planted on dry land, usually on the mounds in between the drainage canals. This practice of drying deep peat generates significant carbon emissions (Hooijer et al., 2010).

In contrast to areas allocated under PIAPS, which legally should remain as forest cover in some form, areas under TORA (Fig. S1) are reserved for forest release to non-forest uses. Some 479,852 ha of state forests in the four study districts have been reserved for TORA. Most of it (86.4%) is Conversion Production Forests (Table 6), as expected. This is followed by Production Forests, Areas for Other uses, Protection Forests and Nature Reserves. Importantly, 96,112 ha or 20% of the TORA are intact forests (Table 6). These forests will be eligible for conversion within the TORA scheme as they will no longer be officially classified as forests. Fortunately, most of the area earmarked for TORA is non-peat, hence with relatively less significant potential emissions per hectare upon conversion. Of all peatlands (8.8% of TORA area), only an insignificant portion (0.2%) is deep peat > 3 m (Table 6).

5. Discussion

In the past three years, the Indonesian government has demonstrated increased commitment to land reform and social forestry, as reflected in Central Kalimantan's progress. For SF particularly, emphasis concentrated on resource mobilization to rapidly attain high land-allocation targets, so licensing processes and implementation

Table 6
TORA allocation in four study districts.

Forest Category	Soil type	Bare/ grassland	Agric & Plantation	Forest regrowth & Agroforestry	Intact Forests
Protection Forests	Not peat	0.2%	0.1%	0.7%	0.1%
	< 50 cm	0.0%	0.0%	0.0%	0.0%
	50-300 cm	0.1%	0.2%	0.3%	0.0%
	> 300 cm	0.3%	0.3%	0.3%	0.0%
<i>Sub-total</i>		0.6%	0.5%	1.3%	0.1%
Production Forests	Not peat	0.5%	0.6%	3.1%	0.4%
	< 50 cm	0.0%	0.0%	0.0%	0.0%
	50-300 cm	0.5%	0.2%	0.5%	0.0%
	> 300 cm	0.0%	0.0%	0.0%	0.0%
<i>Sub-total</i>		1.0%	0.9%	3.6%	0.5%
Conversion Production Forests	Not peat	6.4%	12.0%	43.2%	17.6%
	< 50 cm	0.0%	0.1%	0.1%	0.0%
	50-300 cm	1.4%	1.0%	2.9%	1.5%
	> 300 cm	0.0%	0.0%	0.0%	0.0%
<i>Sub-total</i>		7.9%	13.2%	46.2%	19.2%
Nature Reserves	Not peat	0.0%	0.0%	0.0%	0.0%
	< 50 cm	0.0%	0.0%	0.0%	0.0%
	50-300 cm	0.0%	0.0%	0.0%	0.0%
	> 300 cm	0.0%	0.0%	0.0%	0.0%
<i>Sub-total</i>		0.0%	0.0%	0.0%	0.0%
Areas for Other Uses	Not peat	0.6%	1.2%	2.8%	0.2%
	< 50 cm	0.0%	0.0%	0.0%	0.0%
	50-300 cm	0.1%	0.2%	0.1%	0.0%
	> 300 cm	0.0%	0.0%	0.0%	0.0%
<i>Sub-total</i>		0.7%	1.4%	2.8%	0.2%
<i>Total</i>		10.1%	16%	53.90%	20.0%

Source: Forest category as per Decree of the Minister of Forestry SK.529/Menhut-II/2012. Soil type / peat depth as per the Ministry of Agriculture (Ritung et al., 2011; BAPPENAS, 2013); Land cover as per Miettinen et al. (2016). See Supplementary Materials for details and data descriptions.

suffered. This directly affected activities undertaken by communities within their permit areas.

5.1. Implications for livelihoods

Our findings highlight several issues in terms of SF's livelihoods implications, as they pertain to Central Kalimantan. First, capacity or lack thereof is an important consideration that needs to be addressed if SF participants were to implement SF and capture its livelihoods improvement opportunities. Lack of capital/funding constrains any significant activities to be carried out – both for forest protection and for income generation – in all and every study sites. In fact, rather than generating an income stream, SF can incur costs to participating communities. Our cases show that some communities are currently shouldering the costs of forest protection activities.

Although the government recently passed the regulatory framework for financial provision, including allowing communities to tap into their Village Fund to support SF's activities, communities' responses are mixed.⁸ Not all of the villages are keen to allocate funding from their Village Fund in support of SF. Some of our study villages did use some of this fund for SF, but in meagre sums that finance only a small fraction of monitoring costs. Here, community understanding of the role of SF, its potential short- and long-term benefits, and expectations are key to their making informed decisions on Village Fund use priorities. Many village participants interviewed were adamant that they should only use the Village Fund towards building physical infrastructure, such as

⁸ See Watts et al. (2019) for a discussion of the Village Fund.

concrete/cement village paths and health facilities. Communities conveyed this perspective even for HD whose membership includes all village residents. The justification to allocate the Village Fund for HKM and HTR is even weaker as these schemes only pertain to members of the relevant farmers' groups, rather than to all village residents, and hence would only benefit some members of the village.

Second, providing local people rights to forests through SF enhances their tenurial certainty but not necessarily their productivity or incomes. Limited capital, labour and physical access to forests mean that income-generating forest activities can be pursued only to a limited extent. This is evidenced by community plantation permits (HTR) in which farmers are unable of servicing the entire permit area and therefore need to 'sub-contract' a timber company.

Although capacity is an important constraint, it may also reflect economic rationality of risk-averse communities. Communities may naturally hesitate to shift completely from their current crop-livelihood mix (e.g., rubber) to another mix offered by SF, e.g., fast-growing acacia, for instance. Despite promising market for acacia and the drop in rubber prices, farmers continue to maintain their existing crops and rubber stands as 'banks', and expand acacia only on unused lands. Currently and at least in the near term, timber from households' plots, and presumably from community plantations – when they are realized – thus serves as a safety net or as an additional source of income.

Inaccessibility also prohibits income generation from the already limited opportunities provided by SF in certain forest types, particularly Protection Forests. For example, due to distance from town centers and bad infrastructures (roads) and inaccessibility to sites, communities face difficulties in capitalizing on HDs and HKMs' ecotourism potentials.

Third, emphasis on land-allocation targets leads to a hurried fulfilment of administrative requirements, omitting necessary processes with implications on communities' livelihood improvement activities. High targets promote non-participatory processes, which detract from all SF schemes but particularly riskier for the Village Forests (HD) scheme as it pertains to whole villages. Fast-track processes coupled with inadequate or ineffective information dissemination often result in members' incomplete understanding of schemes and their rights, responsibilities and limitations as permit holders. It is particularly relevant because economic benefit is one important motivation for people's participation in SF. For example, this is evident by the desire of some members of establishing timber plantations within Community Forests (HKM) situated in Protection Forests, where such plantations are prohibited.

Despite the formation of the SF working group and the active work of individual NGOs, efforts to increase community understanding of the program are required. One way is by increasing the role and resources of the Provincial Forestry Service. With personnel stationed at the local levels, their increased mobilization can support the arduous tasks of the regionally based BPSKL.

Fourth, rapid processes to meet administrative targets also promote elite capture of SF benefits, potentially aggravating local economic inequity by improving the livelihoods of a segment of the community while not that of others. In one community plantation scheme (HTR), the leader attempted to list every member of his own family in the hope to secure as much land as possible under the scheme. In the process, a limited number of farmers were included in the initial list. Furthermore, although the list was later revised, it could have promoted intra-community conflicts, rather than resolving them – another objective of SF. Speedy licensing processes can fail to ensure that all relevant members of the community are aware of and engaged in the process, and adequate institutions or systems are in place to minimize elite capture.

Generally, at this point in time, the promise of financial gains or significant livelihood improvements arising from all the three types of permit in Central Kalimantan appears unlikely to be realized soon. This is even more so for the more recent HDs and HKMs, where communities are struggling to protect and maintain their area amidst limited

resources, so that income-generating activities are a later priority. Furthermore, realizing the limited potential due to use restrictions of protected forests, their short-term aim is to secure just enough funds to finance protection activities, such as monitoring (Table 4). In a similar vein, HTR development is constricted by community incapacity, over-dependence on external support, and risk-averse strategies. In line with Ribot (1998) and Ribot and Peluso (2003), enhanced forest rights without the corresponding ability to utilize them does not ensure their benefits.

5.2. Implications for emissions reductions policies

A target-focused SF administration also fosters incomplete or inaccurate on-the-ground verification of land cover. The risk of mis-allocation of licenses in this condition is amplified by the enormous tasks and limited capacities of the BPSKL. Consequently, the allocation of, for example, a community plantation scheme on deep peat, can readily occur. This contradiction fosters confusion among farmer groups about what is legally permissible and undermines SF's environmental objectives. Indeed, given relatively weak monitoring and law enforcement by forestry authorities, certain members of the farmer groups may exploit their new forest rights to further activities causing deforestation. Top-down processes without adequate understanding about what the SF scheme actually entails, repeated failed promises of government programs, expectations of government handouts and the resulting communities' frustration can worsen matters and may backfire against SF forest conservation objective.

The forest categories and types of forest lands allocated to or reserved for SF have direct and indirect implications for emissions reductions efforts. This is an important issue because the proportions of PIAPS within Protection Forests in the four study districts is high: at 22.5% it is higher than the national level (at 17.5%). With permitted income generating activities in Protection Forests restricted to non-destructive and modest undertakings, e.g., NTFP harvesting, it raises questions as to whether SF in such forests can generate an income sufficient to ensure their protection (e.g., through community monitoring, forest patrol) and still provide revenues for community members. A failure to meet such income levels may potentially undermine incentives for forest protection. Similar concerns abound over availability of external assistance and law enforcement by officials.

The significant area of peatland within the PIAPS area highlights implications for carbon emissions. Nationally, peatlands comprise nearly one quarter of PIAPS area. In the study districts, the proportion of PIAPS areas that is peatlands is almost twice as great, where deep peat over three meters as much as 28% (Table 5). Allocating SF on peatlands points to several concerns. Given strict requirements for peatland management, such allocations raise questions as to whether communities with SF licenses are capable, or allowed, to manage their licenses to generate income, or whether instead they are obliged to ensure conservation. As in the case of SF licenses in Protection Forests, the types of permissible economic activities are in doubt on peatlands, as are the source of funds for protection and government capacity in monitoring adherence to regulations. In these circumstances, SF has little potential on delivering livelihood benefits and may undermine emissions reductions efforts despite its strong environmental objective.

Both the environmental promise and economic opportunities of SF in Central Kalimantan remain largely unfulfilled to date. The general attitude of stakeholders, including national policy makers, practitioners, and NGOs, was to exploit the momentum of the SF program to secure forest permits for communities first (various interviews at national and local levels, Oct 2017 and Jan 2018). Only subsequently were issues of implementation considered in depth. This attitude was also observed among communities that were keen to secure tenure to save local forests. This perspective, coupled with inherent challenges to conservation and economic undertakings, means that SF's potential to contribute to welfare and climate change mitigation are unlikely to be

fully realized in the near term.

Ambitious targets within a short time frame propel the prioritization of sites that are easiest to fulfill administratively, i.e., land with clear or uncontested tenure. The result is cherry picking, issuing SF licenses on conflict-free areas (interviews with various MEF officials, October 2017). This ignores one important stated objective of SF, conflict resolution (Table 1).

Three years into the reinvigorated program, the MEF recognizes that 12.7 million hectares of SF by 2019 is too ambitious. The MEF is instead aiming to reach the more realistic target of 4.4 million hectares by end of 2019, expecting to continue commitments with the original target over the longer term (Kuwado, 2017). Despite drastic reduction in the target area, there is still some ways to go to meet the lower target. More importantly, it is highly unlikely that SF implementation can follow the pace of licensing, despite the significantly reduced target area, given less than one year remaining in the current administration.

This paper discusses TORA only as it pertains forests and its implications for climate change and livelihoods. In comparison to PIAPS (SF), the indicative area for TORA allocation in the study districts may seem to have insignificant implications on emissions, and hence for climate change mitigation, due to its lesser area of peatland. Still, the appreciable allocations of intact forests for TORA is significant because, once designated for TORA, such forest can be cleared entirely. Implications for livelihood would depend on future land use and the availability of resources to that end.

Finally, one caveat is the relatively short period that has elapsed between the granting of permits and the implementation of this research. However, the issues highlighted above would need to be addressed for SF to result in positive outcomes for livelihoods and climate change mitigation.

6. Conclusions

As part of its fair-for-all economic policy, the Indonesian government is reviving its land reform program. With a significant land area of the reform occurring in forests, the changes are supposed to improve the livelihoods of forest dependent communities, protect forests, and mitigate climate change. The reinvigorated SF program has achieved some notable improvements compared to past implementation. A larger forest area compared to the past has been allocated or reserved for local use within a much shorter time frame. Local communities now have more defined and secure tenure to state forest lands, providing additional land and formally secure their current plots.

At face value, the objective of reducing inequity appears to be on the right track. Despite improvements, particularly in the size of forest land assigned to local communities, ambitious target and hurried distribution have raised issues of processes and implementation. They are communities' partial understanding of schemes, rights and responsibilities, inappropriate site allocation and types of forest land distributed, inadequate considerations for community capacity, and inattention to local governance requiring improvement. In Central Kalimantan, as things currently stand, these and issues of inadequate resources and capital prevent SF to achieve its full potential in improving people's livelihoods. Similarly, these same issues pose a risk to forest-based emissions reduction efforts. Rather than improved forest management, they and economic necessities limit forest protection activities and may even lead to inappropriate forest conversion, undermining SF's environmental goals, including Indonesia's climate change commitments. The program will have a greater chance to contribute to livelihoods and the environment when these challenges are addressed.

In addition to challenges in fulfilling the two goals, SF's current implementation also risks missing out on the objective of reducing tenurial conflicts. Rather than prioritizing on resolving conflict areas, a 'target mode' leads to a focus on the 'lowest hanging fruit', i.e., allocating mostly conflict-free areas for SF.

Various forest categories and forest conditions have been allocated or reserved for SF, including intact and deep peat forests. Careful consideration must be given in allocating the individual type of schemes for these areas, as well as enough attention and resources in their monitoring and enforcement. Similarly, a significant area of standing forests has also been reserved for TORA. Slated for conversion to accommodate non-forest uses, the designation of such forests for TORA should be avoided in consideration of their environmental and emissions repercussions.

Emphasis on 'securing access first, implementation later' poses a risk of 'implementation deficit'. There is a real risk of limited subsequent activities once permits are obtained, thus foregoing optimal use of opportunity for welfare improvement and climate change mitigation. In fact, the speed in which licenses are distributed that is not accompanied by equal attention to resources or support for implementation present risks of ill-perception towards the livelihoods benefits of the program and promote improper management of forests and peatlands, and in turn potentially jeopardizes the government's commitment to mitigate climate change. Both forest protection and initial forest-based undertakings imply costs to communities. Thus, lack of support for implementation can point to the issue of unfairness, where, under the disguises of devolving authority of forest management, it is actually shifting the responsibilities of forest conservation to communities. At the same time, it raises the question of whether SF's intentions of improving livelihoods consider the condition of the forests managed under the scheme.

We propose that government's targets do not stop at the number of hectares distributed but are reformulated to include criteria and indicators of SF performance in implementation. In parallel, more resources – on par with those allocated for permit distribution – should be allocated to support activities post acquisition of permits.

This research analyzes the implementation of Indonesia's land reform in the first three years of the current five-year administration and focuses on its dynamics in Central Kalimantan. It allows to capture lessons learnt early on. Nevertheless, further research after the reform has been implemented for a longer period would provide additional insights. In depth examination of specific initiatives with a broader coverage beyond Central Kalimantan and across Indonesia would also be useful.

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Declarations of interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.forpol.2019.04.007>.

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