REDD+ Safeguards Brief 6

Designing Low-cost, Rigorous and Sustainable REDD+ Safeguard Information Systems

Using publicly available social and spatial data and impact evaluation methods to assess REDD+ social safeguards in Kalimantan, Indonesia

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Developing low-cost, rigorous and sustainable systems for the measurement, reporting and verification (MRV) of national or subnational social safeguards presents a major challenge to governments, policy makers, REDD+ implementers and other key stakeholders.

READ THIS BRIEF IF…

- You are concerned about how REDD+ social safeguards will be measured, reported and verified
- You are designing a REDD+ SIS
- You are skeptical about quantitative evaluation of REDD+ social impacts
- You want an example or proof of concept of the quantitative assessment of REDD+ social safeguards.

KEY MESSAGES

- There is potential to hold REDD+ Safeguard Information Systems (SIS) to standards as rigorous as those for carbon MRV. Identifying a counterfactual or comparison group is a key challenge.
- Some Cancun social safeguards are easily operationalized, others—for example, participation and free, prior and informed consent (FPIC)—are more challenging.
- Data that track outcomes over time for the same units are rare. There is a need to strengthen ongoing national data collection efforts to include data relevant to REDD+ SIS.
- Integrating spatial and social data, data quality and completeness are challenges for REDD+ SIS.
- Estimating average treatment effect on the treated (ATT) using publicly available social and spatial data is possible.

CONTEXT AND CHALLENGES FOR REDD+ SIS

Funding for developing REDD+ SIS at national or subnational scales is likely to be very low. We propose an approach for social safeguard MRV that is relatively low-cost, rigorous and sustainable. We provide proof of concept for our approach using publicly available spatial and socioeconomic data for Kalimantan, Indonesia, where REDD+ pilot activities have been taking place since 2009 (Figure 1).

Figure 1. Map of Kalimantan with REDD+ project boundaries

ANALYTICAL ISSUES FOR REDD+ SIS

There are several challenges associated with developing a REDD+ SIS that is low-cost, rigorous and sustainable. We have identified the following analytical issues:

(i) **Attribution**: Design SIS to address the issue of attribution. We want to construct a counterfactual or comparison group that reflects what would have happened in the absence of REDD+ (analogous to a business-as-usual or reference-level approach to monitoring carbon).

(ii) **Operationalization of safeguards**: Define social safeguard indicators that are relevant to national or subnational settings. Indicators could include incidence of illegal land burning (governance), participation in village meetings (participation) and access to basic health and education services (social benefits).

(iii) **Theory of change**: Develop a theory of change based on knowledge of what has happened in the past. The main idea is to search for causal explanations linking REDD+ activities with expected outcomes.

(iv) **Data availability and quality**: Identify socioeconomic and spatial data sources. Our criteria for appropriate data are as follows:

- publicly available
- contains variables that effectively operationalize and measure REDD+ outcomes
- socioeconomic data are geo-referenced, or have some provision for integration with spatial data
- available over time and part of ongoing data collection efforts
- at appropriate scale with the objective of conducting analysis at the smallest scale possible.

(v) **Compilation and analysis of data**: Integrate longitudinal social and spatial data. Depending on the design selected to address attribution, estimate ATT of REDD+ on project outcomes.

CASE STUDY OF KALIMANTAN, INDONESIA

Following the analytical steps described above, we conducted a case study of REDD+ social impacts in Kalimantan, Indonesia.

(i) **Attribution**: We used propensity score matching (PSM) to identify a matched set of REDD+ and non-REDD+ villages (Figure 2). PSM uses observed variables to predict the probability of experiencing an event (in our case, participation in REDD+) to create a counterfactual group (Becker and Achino 2002). The PSM required information about past forest governance and several exogenous variables (for example, population density, market access) to identify good matches. Ideally, our matched sets of REDD+ and non-REDD+ villages are as similar as possible, except for the presence of REDD+ in the village.

(ii) **Operationalization of safeguards**: We identified a list of possible variables that effectively operationalized key safeguard concepts. Important safeguard-related issues in Indonesia include: the challenges of decentralized forest governance and corruption, indigenous rights, tenure insecurity, weak public participation in environmental decision making, and heavy reliance on forests and swidden agriculture as livelihood strategies.

(iii) **Theory of change**: We developed a theory of change for each variable to hypothesize its relationship to REDD+. For example, REDD+ projects that provide extension support for agricultural intensification will reduce pressure on natural forests and lead to higher incomes from agriculture.

(iv) **Data availability and quality**: We used data from the PODES datasets (Pendataan Potensi Data – Village Potential Statistics), which are village-level data collected by the Government of Indonesia in collaboration with Rand Corporation. PODES data are collected at roughly 3 year intervals; we used data for 2005, 2008 and 2011.

(v) **Compilation and analysis of data**: We integrated longitudinal social and spatial data. We used difference-in-difference estimation in a multivariate regression framework to estimate the ATT of REDD+ on social outcomes.

Given the short time that REDD+ activities have been taking place in Indonesia, we did not expect to see large treatment

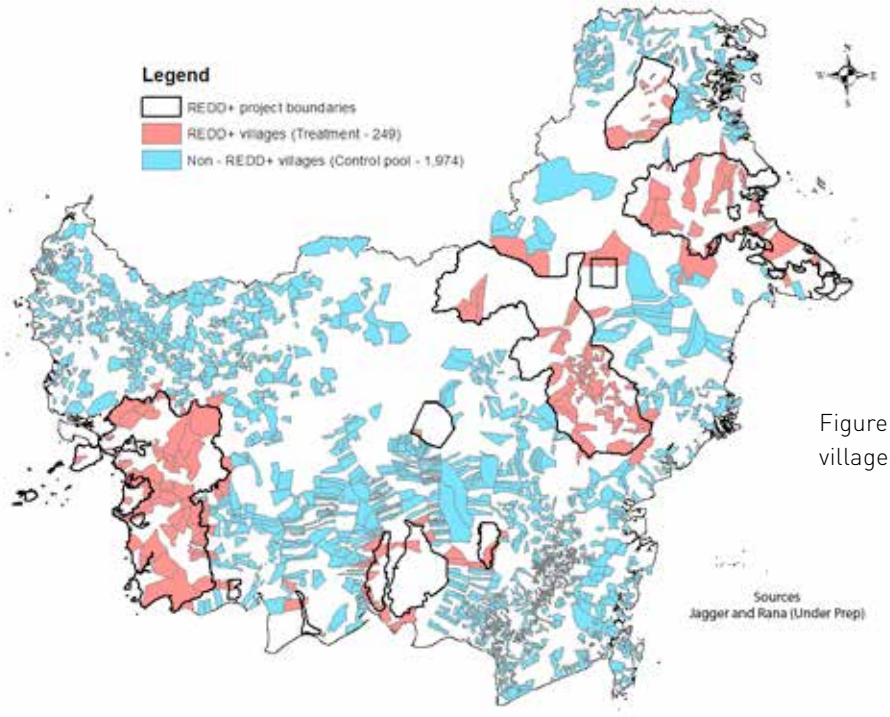

Figure 2. REDD+ and non-REDD+ villages in Kalimantan, Indonesia

Table 1. Average treatment effect on the treated (ATT) for select REDD+ social safeguard indicators

Safeguard	Operationalization	Hypothesized relationship to REDD+	Average treatment effect on the treated (ATT)			
			Kalimantan	West	Central	East
Transparent governance (Cancun Safeguard 2)	Customary land burning	-	+	_ _	_	+++
Social benefits (Cancun Safeguard 5)	Poor letters issued	-	+		++	
	Jamkesda cards	_	_ _	_		
	Presence of telephone communication	+	_ _ _			_ _ _
	Households using liquid petroleum gas (LPG)	+	_ _ _	_ _ _		_ _ _
	Agricultural intensification	+			++	

effects for most variables. We did, however, observe statistically significant effects for some REDD+ social safeguard indicators (Table 1). For example, land burning is illegal in Kalimantan as it is a major driver of deforestation, yet it is an important strategy for clearing land. If land burning declines under REDD+ that could be interpreted as a signal of more effective and transparent forest governance. For Kalimantan as a whole, we found that REDD+ is associated with an increase in customary land burning. However, when we examine the effects by province, we find that for West and Central Kalimantan, customary land burning declined in REDD+ villages, whereas in East Kalimantan there was a significant increase in customary land burning (compared to the matched set of non-REDD+ villages).

We considered two indicators of welfare. The number of poor letters (SKTM) is an indicator of the overall well-being of people in the villages. These are letters issued to poor households so that they can access social services. We expected that if REDD+ had a positive effect on livelihoods, the number of poor letters would decline; however, we observed the opposite. We found that the number of poor letters in REDD+ villages increased when compared with the matched set of non-REDD+ villages. However, we also observed that the number of Jamkesda cards distributed has declined in Kalimantan. Jamkesda cards are given to low-income households so that they can access medical services at no cost (Figure 3).

The presence of telephone communication and the use of LPG are considered indicators of connectivity and increasing well-being within a village. If REDD+ is having a positive effect on overall well-being we would expect a positive relationship between REDD+ and these indicators. However, in our analysis we found the opposite effect, suggesting that communication and modern fuels are less available in REDD+ sites. Finally, we considered evidence of agricultural intensification to be positively associated with economic well-being. In Central Kalimantan, REDD+ is associated with an increase in agricultural intensification.

Our aim in this analysis is to demonstrate that publicly available spatial and socioeconomic data can be used to monitor some aspects of REDD+ social safeguard impacts over time. Our findings on the impacts of REDD+ should be interpreted with caution. The variables we have chosen as social safeguard indicators may need refinement, and it is very early to evaluate REDD+ social impacts given the slow roll-out of REDD+ activities in many project sites.

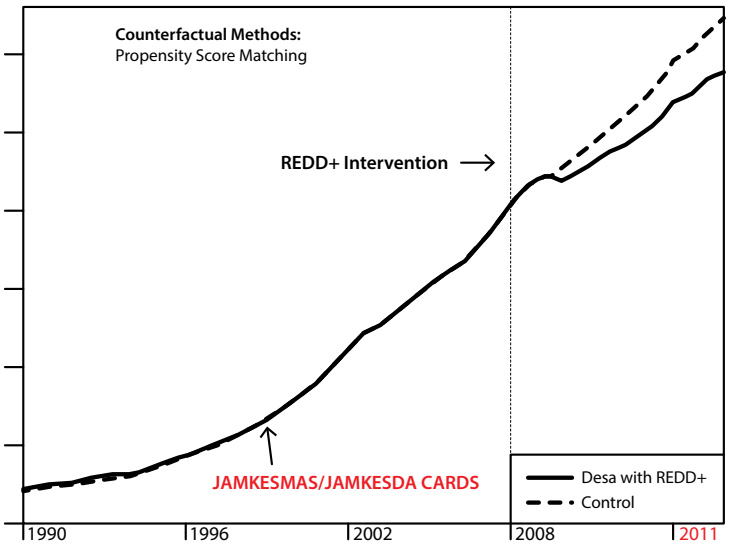

Figure 3. Number of poor letters before and after REDD+

LIMITATIONS AND CHALLENGES

- Representativeness of data: We were only able to construct a complete dataset for about 40% of the villages in Kalimantan. A number of variables had missing data, which makes building a comprehensive dataset for analysis challenging. Missing data present a significant problem for internal as well as external validity.
- Data suitability problems: The lack of geo-referenced data, incompatibility of layers—in terms of their spatial and temporal resolution, and inconsistent spatial data creates problems for operationalizing several social safeguard indicators.
- Applicability: The ability to operationalize safeguards related to tenure and FPIC is limited because data for indicators are not collected in national surveys.
- Causal effects: We emphasize that the type of analysis we have presented is not a direct substitute for ground truthing of REDD+ social impacts. We urge that policy makers strive to develop systems that allow for large-scale assessment of social impacts over time, but also put into place processes that will allow for validation of observed impacts.

RECOMMENDATIONS

Our focus is on developing proof of concept for low-cost, rigorous and sustainable REDD+ SIS. We recommend against designing entirely new and potentially costly systems for MRV of REDD+ social safeguards. Leveraging and improving upon ongoing national and subnational data collection efforts should be strengthened to include key geo-referenced indicators for a full range of social safeguard indicators associated with REDD+. We also call for integrating carbon and social MRV systems so that REDD+ social impacts can be evaluated alongside forest carbon outcomes.

REFERENCES

Becker SO and Ichino A. 2002. Estimation of average treatment effects based on propensity scores. *Stata Journal* 2:358–77.

Jagger P, Sills EO, Lawlor K and Sunderlin WD. 2010. A guide to learning about livelihood impacts of REDD+ projects. Occasional Paper 56. Bogor, Indonesia: Center for International Forestry Research. Accessed 28 October 2014.

UNFCCC. 2011. The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperation Under the Convention. Decision 1/CP.16. Report of the Conference of the Parties on its Sixteenth Session, Cancun, 29 November–10 December 2010. FCC/CP/2010/7 Add.1. Bonn, Germany: United Nations Framework Convention on Climate Change.

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CGIAR RESEARCH PROGRAM ON Forests, Trees and Agroforestry

This research was carried out by CIFOR as part of the CGIAR Research Program on Forests, Trees and Agroforestry (CRP-FTA). This collaborative program aims to enhance the management and use of forests, agroforestry and tree genetic resources across the landscape from forests to farms. CIFOR leads CRP-FTA in partnership with Bioversity International, CATIE, CIRAD, the International Center for Tropical Agriculture and the World Agroforestry Centre.

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