Local perspectives on REDD

In comparison with those at the international negotiation tables and their representation in quantitative scenario models

Conflicts over land are aggravated by a large REDD+ pilot project; new forms of 'village forest' are to be part of the solution

Project Report

World Agroforestry Centre

BOX 1. Overview of the REDD ALERT project

The European Union financed the REDD ALERT project (contract number 226310) to contribute to the development and evaluation of market and non-market mechanisms and the institutions needed at multiple levels for changing stakeholder behaviour to slow deforestation rates of tropical landscapes and hence reduce greenhouse gas (GHG) emissions. Its specific objectives six-fold.

1. Document the diversity in social, cultural, economic and ecological ***drivers of forest transition*** and conservation and the consequences in the context of selected case studies in Indonesia, Vietnam, Cameroon and Peru as representative of different stages of forest transition in Southeast Asia, Africa and South America.

2. ***Quantify rates of forest conversion*** and change in forest carbon stocks using improved methods.

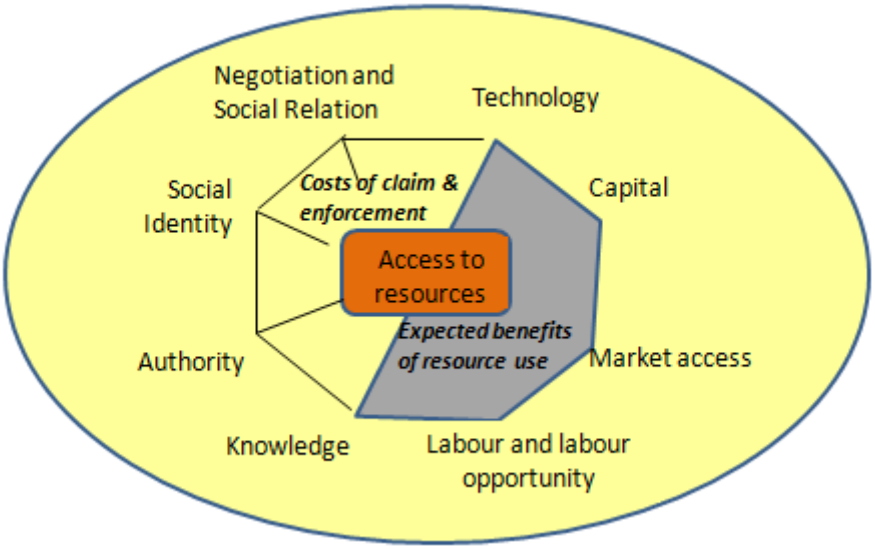
3. Improve accounting (methods, default values) of the consequences of land-use change for ***GHG emissions in tropical forest margins including peat lands***.

4. Identify and assess viable ***policy options addressing the drivers of deforestation*** and their consistency with policy approaches on avoided deforestation currently being discussed in UNFCCC and other relevant international processes.

5. Analyse scenarios in selected case study areas of the ***local impacts of potential international climate-change policies*** on GHG emission reductions, land use and livelihoods.

6. Develop ***new negotiation support*** tools and use these with stakeholders at international, national and local scales to explore a basket of options for incorporating REDD into post-2012 climate agreements.

Local perspectives on REDD in comparison with those at the international negotiation tables and their representation in quantitative scenario models



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Synopsis

The international REDD$^+$ debate has so far focussed on 1) the scope (RED, REDD, REDD$^+$) of efforts to reduce emissions from a subset of wider land-use issues; 2) the financial incentives ($/t$CO_2$e) and associated accounting and disbursement mechanisms; and 3) safeguards that local perspectives be taken into account ('free and prior informed consent') and biodiversity co-benefits be achieved. From the local perspective of stakeholders living in tropical forest margin, the REDD$^+$ debate is an additional complication in an already complex relationship that they have with central governments and forest authorities. Can they make use of the REDD$^+$ interest of their national government to further their livelihoods strategies and development aspirations? Or will the REDD$^+$ implementation measures set them back in their conflicts over resource access? We provide a number of case studies of two high carbon emission provinces in Indonesia, the land with the highest land-based carbon emissions. Conflicts over land are shown to be aggravated by a large REDD$^+$ pilot project in Central Kalimantan, but new forms of accommodating forest-edge villages in stabilising forest margins through 'village-forest' agreements in Jambi are promising to become a major part of the solution. A deeper analysis of the community-level motivation for resource protection and household decisions about preferred land uses revealed the importance of social context in land use decisions. The model representation of 'agents' interacting in dynamic land-use models have not so far captured the richness of influences and 'bounded rationality' beyond household level economic optimisation. A nesting of models is proposed that will describe interactions between natural, social, human, financial and physical capital at multiple scales, with the primary cross-scale interactions restricted to the various capital types, and the cross-capital interactions restricted to an identical scale. A stakeholder analysis of REDD$^+$ perspectives at provincial scale will be used in such models.

Publications	**Policy briefs**
Attachment 3. Galudra G, van Noordwijk M, Suyanto, Sardi I, Pradhan U, Catacutan D. 2011. Hot Spots of confusion: contested policies and competing carbon claims in the peatlands of Central Kalimantan, Indonesia. International Forestry Review (in press)	**Attachment 1.** Galudra G, van Noordwijk M, Suyanto, Pradhan U. 2010. *Hot spots of confusion: contested policies and competing carbon claims in the peatlands of Central Kalimantan, Indonesia*. ASB Policybriefs 21. Nairobi: ASB Partnership for the Tropical Forest Margins.
Attachment 4. Akiefnawati R, Villamor GB, Zulfikar F, Budisetiawan I, Mulyoutami E, Ayat A, van Noordwijk M. 2010. Stewardship agreement to reduce emissions from deforestation and degradation (REDD): case study from Lubuk Beringin's Hutan Desa, Jambi Province, Sumatra, Indonesia. *International Forestry Review* 12: 349–360.	**Attachment 2.** Akiefnawati R, Villamor GB, Ayat A, Galudra G, van Noordwijk. 2010. *Stewardship agreement to reduce emissions from deforestation and degradation (REDD) in Indonesia.* ASB Policybriefs 18. Nairobi: ASB Partnership for the Tropical Forest Margins.
Attachment 5. Villamor GB, van Noordwijk, M. Private and social motivation of local co-investment in environmental services and participation in conservation agreements: perception survey and	

simulation games in a rubber agroforest village in Jambi, Sumatra, Indonesia. Ecology and Society (under review)	
Attachment 6. Villamor GB, van Noordwijk M, Le QB, Lusiana B, Mathews R. 2010. Diversity deficits in modelled landscape mosaics. *Ecological Informatics* doi:10.1016/j.ecoinf.2010.08.003	
Attachment 7. Van Noordwijk M, Lusiana B, Villamor G, Purnomo H, Dewi S. 2011. Feedback loops added to four conceptual models linking land change with driving forces and actors. *Ecology and Society* 16(1): r1. Available from http://www.ecologyandsociety.org/vol16/iss1/resp1/	
Attachment 8. Purnomo H , Suyamto D, Abdullah L, Irawati RH. REDD+ actor analysis and political mapping: an Indonesian case study. Manuscript.	

Table of Contents

Overview of efforts to map local perspectives on REDD

Local perspectives on REDD tend to differ from those at the international negotiation tables. Mapping the local perspectives and representing them in quantitative scenario models is part of work package 6 of the REDD-ALERT project (Box 1 on page 1).

The international REDD$^+$ debate (Figure 1) has so far focussed on 1) the scope (RED, REDD, REDD$^+$) of efforts to reduce emissions from a subset of the wider land-use issues; 2) the financial incentives ($/t$CO_2$e) and associated accounting and disbursement mechanisms; and 3) safeguards that local perspectives be taken into account ('free and prior informed consent') and biodiversity co-benefits be achieved.

Figure 1. Main issues in the international debate about scope of REDD$^+$, relation between finances and emission reduction and social and co-benefit safeguards, as well as some of the issues at local level: conflicts over access to land, perspectives on national and regional development, and alternative livelihood options

The local perspective on development opportunities and current livelihoods can be analysed as focused on resource access (Figure 2).

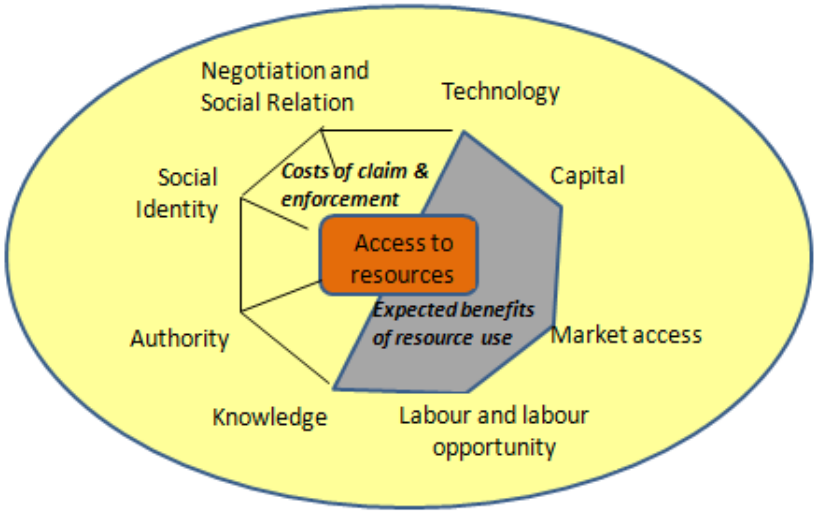

Figure 2. Local perspective on access to resources as basis of livelihood strategies (Attachment 3)

Figure 2 splits the various factors that relate to resource access into one group that influences the costs of claims and enforcement and another group that influences the benefits that can be obtained if access to a resource is secured. This grouping allows a simple benefit/cost comparison of efforts to secure access to additional resources: if market access plus technology plus labour availability makes resource use attractive and profitable and/or if it is relatively easy to stake a claim and enforce one's position in the given social and political context the ratio may be well above 1 and efforts are likely to pay off. Shifts in social identity, social relations, authority knowledge and technology can reduce or increase the costs of claims and enforcement. Changes in market access, capital, labour and labour opportunity, knowledge and technology can shift the expected benefits of resource use. Please note that knowledge and technology can influence both the cost and the benefit aspect of the ratio.

This simple scheme can account for increases in conflict with shifts in the stakes that stakeholders have with various types of resource use. REDD$^+$ has increased the stakes of government and external agents in non-use of the resource (carbon-stock preservation in forests).

If we combine the international and local perspectives (Figure 3), we can see that the international debate and local perspectives are not yet well aligned. It is, however, possible to see A) the scope aspects of the REDD$^+$ debate as directly linked to forest land status and its conflicts; B) the carbon price issue as linked to national and regional development perspectives; and C) the safeguards as relating to alternative livelihoods options.

Figure 3. Combined local and international perspectives by merging figures 1 and 2

In this deliverable D6.1, a number of scientific publications are compiled, as well as policy briefs derived from them. All refer to Indonesia, the country with the highest land-based emissions (forest and peat) and an early mover in national commitments to reduce emissions. The high-level policy commitment to REDD+ and the self-imposed Nationally Appropriate Mitigation Actions (NAMA) have, however, not yet been fully translated into the various local contexts within the archipelago. The diversity of development stages, drivers of change, ethnic identities and histories of local-to-central government relations in the country is considerable.

Local perspectives on 'forest transition' and development pathways will be at least as important for the success of any REDD+ program as the international perspectives that have taken several years of negotiation before the Cancun COP endorsement. Important aspects of these local perspectives are:

A. Contested tenure in tropical forest margins

B. Household land-use decisions in tropical forest margins

C. Local government roles in REDD+ goal setting and implementation

Progress in our understanding of each of these three aspects is reported here.

A. Contested tenure in tropical forest margins

The Ministry of Forestry of Indonesia interprets the 1999 Forestry Law as reconfirming state ownership of the 'forest zone' (*kawasan hutan*), although legal procedures to establish this claim have only been completed for about 12% of the country (Contreras-Hermosilla and Fay 2005). De facto land management by local communities, that has received various degrees of recognition by colonial and post-independence governments, has not been reconciled with the state claims and levels of government other than the Ministry of Forestry are partly supportive of these claims.

In Central Kalimantan, conflicts have been heightened by the expectations of REDD+ finance that may be used to obtain a net benefit. The peat lands of Central Kalimantan, hot spots of emissions after the failed 'mega-rice project', have become hot spots of conflict over REDD+ implementation. The first large-scale REDD investment in Indonesia (Australian-supported Central Kalimantan Forest and Peat land Project) has not yet found effective ways to overcome the conflicting claims. ***Attachments 1*** and ***3*** provide a policy brief and peer-reviewed journal article that analyse the case.

Legal options for a 'compromise' exist in the form of 'village forest' agreements where the Ministry of Forestry retains its ownership claim but allows village management structures to operate a form of community-based forest management. Implementation of this legal opportunity has been slow; the first agreement was signed in 2009 in Lubuk Beringin in Jambi province. ***Attachments 2*** and ***4*** are a policy brief and peer-reviewed journal article that analyse the case and its implications for expansion.

B. Agent-based models and household decisions in tropical forest margins

Livelihoods strategies of local communities on forest margins tend to combine elements of 'subsistence' economies with local provision of goods and services and market-based income

generation that allows the acquisition of external goods and services. In this transition phase the norms and values at community level that regulated 'subsistence' use of resources gradually give way to more individualistic market orientation. The mix of social- and private-scale economic impacts of decisions to change land requires interdisciplinary tools of analysis to be understood.

Agent-based models that potentially combine economic and social elements of decision making can be applied to increase predictability of the result. ***Attachment 5*** is based on a case study in Lubuk Beringin (the first recognised 'village forest' community) and contrasts household survey results with expressed preferences in a role-play simulation game. ***Attachment 6*** provides a review of agent-based models in the literature and the way they represent household level decisions.

C. Roles of local government and their representation in models

Land -use planning and forest zoning have been the major government instruments regulating the rates and location of forest conversion as part of 'business as usual' development trajectories (van Noordwijk et al. 2008) A balance between 'top-down' and participatory 'bottom-up' approaches is hard to achieve but will be essential for success in REDD+ implementation. ***Attachment 7*** provides a comment on existing overviews of models of drivers=>actor=> land-cover change, focussing on the feedback loops. ***Attachment 8*** gives an account of local government perspectives of REDD+ at provincial and district levels in Jambi province.

Throughout these accounts the concepts of 'fairness' as primary 'bottom-up' characteristic of REDD+ is contrasted with a search for 'efficiency' that drives the external ('top-down') agenda. Further deliverables in work package 6 of REDD ALERT will focus on the trade-offs and potential for synergy between fairness and efficiency in REDD value chains.

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Van Noordwijk M, Purnomo H, Peskett L, Setiono B. 2008. *Reducing emissions from deforestation and forest degradation (REDD) in Indonesia: options and challenges for fair and efficient payment distribution mechanisms.* Working Paper 81. Bogor, Indonesia: World Agroforestry Centre.

Attachment 1. Hot spots of confusion: contested policies and competing carbon claims in the peatlands of Central Kalimantan, Indonesia. ASB Policy-brief 21.

ASB Partnership for the Tropical Forest Margins

Policybrief 21

Hot spots of confusion: contested policies and competing carbon claims in the peatlands of Central Kalimantan, Indonesia

Main findings

1. Contesting claimants were found to use current contradictions and inconsistencies of Indonesian laws, multi-sector policies and the articulation of local property rights and customary rights.

2. The ambivalence of the forest definition and associated property rights has 'path dependence', reflecting historical change of government laws, paradigms and public administration.

3. Legal arguments are not necessarily decisive in settling disputes, but the lack of respect for legality contributes to confusion, undermining authority.

4. Carbon rights in this area are not clear yet. They are at least as complex as the set of actors and agents who interact during the process that starts with a natural forest and ends with a landscape with few trees, high emissions but still high carbon stock.

Implications

- The state at national and provincial levels are two among several claimants and negotiated cooperation among stakeholders will be needed, rather than asserting a single legal authority.
- Market-based REDD+ implementation will add confusion as unresolved carbon rights come as an addition to the already complex layers of unresolved property rights.
- A co-investment paradigm of REDD+ can contribute to resolving disputes on property rights and seek more transparent use of state authority and power.

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The expectation of financial incentives for emission reduction has led to a debate on 'carbon rights'. In many countries, debate a power contest uncovers among the government layers. The interaction of 'carbon rights' with existing or emerging rights, authorities and power over land-use decisions is not easily understood. Land 'ownership' is only one of several elements influencing the level of emission reduction. Emission reduction is measured as a change over time in carbon stocks, relative to agreed baseline or expected change and after correction for leakage or displacement of emissions to other locations. These alone demand clarity and procedural justice if the 'legal basis' of property rights and governance over forested land and resources is to be resolved. However, this clarity does not yet exist in many landscapes in Indonesia. Hence, 'carbon rights' come as an addition to the already complex layers of unresolved property rights. The complexity extends from the relationship between individuals and local communities, between both of these and local government, between sub-national entities and Indonesia as a state, and in Indonesia's relation with global negotiation platforms on mitigating climate change.

Shifted policy, shifting regime: confused to management of forest peatland

The peat domes of Central Kalimantan Ex-Mega-Rice Area cover around 1.5 million ha on the interfluves of a number of rivers. These rivers have a long history of human use, with a string of settlements and a tradition of upstream-downstream mobility of various ethnic groups practising 'swiddens' along with shifting village locations. Ownership claims on some parts of the riverbanks and hinterland depend on the details of the settlement history. During the colonial era, de facto use of the riverbanks was sanctioned by the government, but after independence the Republic of Indonesia claimed ownership of, and control over, all land and resources for the benefit of the people of Indonesia. The Agrarian Affairs Office in the early 1970s concluded that customary institutions had already diminished, leaving local people with vague or no land-use rights. But when the State started granting permits for logging concessions in designated forest areas, de jure concessions clashed with de facto use rights of local people. The construction of drainage canals for the Mega-Rice Project and establishment of transmigration settlements not only brought a new influx of migrants with land ownership claims, but also altered the institutional arrangements and property rights of existing local communities. The Mega-Rice Project shifted the existing property rights in the area into what was considered to be an open access regime. Each villager began to compete to gain access to natural resources. Confusion and rights contestation worsened in the 1997/1998 'forest fire' episode that hit the area. The forest fire was interpreted as a result of a combination of El Nino conditions causing a prolonged dry season and the increased vulnerability of peatland by drainage and logging. The extent of carbon release into the Indonesian atmosphere was estimated to be between 0.81 and 2.57 Gt— this is equivalent to 13–40% of the mean annual global carbon emissions from fossil fuels—which contributed greatly to the largest annual increase in atmospheric CO_2 concentration ever detected. These episodes of fire events pushed the government to close the Mega-Rice Project (thus becoming the 'Ex-Mega-Rice Project') and, since then, efforts were focused have

Table 1. What type of resource use?

Resource Use	Swidden and fishing and non-timber forest product economy	Logging	Rice	Rubber and oil palm plantations	Carbon-stock peatland (REDD)
Proponent	Traditional and local communities	Ministry of Forestry before 1995	Central government before 1998	Migrant population and local government (oil palm component)	Central government and Ministry of Forestry after 2007
Current debate	⇩	X	X	⇩	⇩
Examples of Current discourse	"Communities are customary people with traditional rights and ownership to the land, trees and water" "Customary rights are being protected and recognized since the Dutch and now by local	X	X	"The area had been reserved for food estate purpose based on MoF No 166/1996" "Oil palm plantation can provide labor opportunities for people, especially for transmigration"	"Peatland must be conserved and protected from any land-use as it historically caused periodic forest fire"

Table 2. Notes of 'legal' discourse and disputes used by provincial government and Ministry of Forestry

No.	Date of Issue	Note	Legal and Discourse Statement
1.	12 September 2000	Ministry of Forestry Note No. 778/VIII-KP/2000	• Acknowledges the Governor's Decree No. 008/965/IV/BAPP as the final 'legal' result of harmonization between provincial spatial development plans (RTRWP) and forest land-use by concession (TGHK) • Stipulates that the land that has been regarded as non-forest zone (APL) under this decree may not need forest zone status conversion
2.	11 September 2006	Ministry of Forestry Note No. 5.575/ Menhut-II/2006	• The Governor's Decree No. 008/965/IV/BAPP/ 1999 cannot be used for final legal result of harmonization because it had not been followed by a Ministry of Forestry decree on forest designation • Ministry of Forestry Note No. 778/VIII-KP/2000, revoked 12 September
3.	2 November 2006	Governor of Central Kalimantan Note No. 126/1809/Ek	• The Ministry of Home Affairs No. 050/2301/1996 stipulates that the harmonization process can be solved through a Governor's Decree. Therefore, the decree above is 'legal' • The harmonization process had been consulted with the Directorate General of Forest Planning within the Ministry of Forestry
4.	22 December 2006	Ministry of Forestry Note No. 5-776/Menhut-II/2006	• Insisted that the Governor's Decree cannot be used as the legal basis for forest status conversion • All land-use planning must follow 1982 forest land-use by concession (TGHK)
5.	3 January 2007	Governor of Central Kalimantan Note No. 522/010/Ek	• Insisted that the 2003 Provincial Spatial Plan that is based on the Governor's Decree above can be used for the regencies to convert forest to other land-use systems • Instruct the regencies to not hesitate to convert forest to other
6.	13 April 2007	Ministry of Forestry Note No. 5.225/Menhut-II/2007	• Insisted that the provincial government follow Ministry of Forestry Note No. 5.575/ Menhut-II/2006 • Reiterated previous statements that the 2003 Provincial Spatial Plan must be followed by the Ministry of Forestry Decree to be considered a legal forest-status conversion
7.	3 July 2007	Governor of Central Kalimantan Note No. 522.11/ 1084/Ek	• Agreed to support the consistency of laws and regulations • Denied the accusation that the 2003 Provincial Spatial Plan was the result of a harmonization process between provincial spatial development plans (RTRWP) and & forest land-use by concession
8.	3 July 2007	Governor of Central Kalimantan Note No. 522.11/ 1089/Ek	• Instructed the regencies not to issue any permits within the forest zone until the dispute was settled

been rehabilitating the area. There is increasing consensus that emission reduction in peatland is technically feasible, urgent (high emissions) and probably cost effective. It is explicitly mentioned as part of the Indonesian–Norway Letter of Intent signed in 2010. Several donors and international organizations are exploring effective ways of reducing emissions in this area, to bring peatland emissions into the emerging REDD schemes.

Conflict of authority and power struggle dominate the discourse on 'rights'

The policy adopted by the provincial government to exploit the Ex-MRP area was in contrast with recent central government policy. The provincial government claimed scientific support for its position with reference to a study by the Agricultural Research and Development Office in 1998, showing that around 327 853 ha and 345 340 ha of the Ex-MRP are considered suitable for oil palm cultivation and rubber plantations, respectively. Besides scientific support, the provincial government uses the Minister of Forestry's (MoF) Note No. 778/VIII-KP/2000 to argue their 'legal claim' over the exploitation of the Ex-MRP for oil palm and mining concessions. The Note provides a legal basis for the provincial government to convert state forest lands into other land-use systems, as long as conversion is accompanied by spatial developments plans. However, in 2006, the central government issued a Note, which superseded the previous Note, and demanded seizure of all concession permits issued by the provincial government since the year 2000. The Note also deemed the 2003 spatial planning regulation of the provincial government illegal. The provincial government defended its decision by stating

that the spatial development plan, which was rendered illegal by the MoF, had been harmoniously processed with consent and in conjunction with the forest land-use map (TGHK) of the MoF, too, which was supported and approved by the Ministry of Home Affairs. After presenting these facts, the provincial government accused the MoF of unreasonably and irresponsibly rendering the 2003 spatial planning regulation illegal. The MoF reacted that the provincial government's management claim over the Ex-MRP area could not be treated as 'final' since there had not been a forest designation decree. Once again, the MoF ruled-out the legality of the 2003 spatial planning regulation in that it couldn't be used as a legal basis for converting the forest status and exploit the Ex-MRP for oil palm and mining concessions. The conflict of authority between the Central Kalimantan Provincial Government and the MoF created much confusion at the regency government level: the provincial government insisted on the regency government continuing to apply the 2003 spatial planning regulation as a basis for exploiting the forest, including the project area, and to ignore the MoF's demands.

The MoF was challenged by the aggressive actions of the provincial government and demanded the termination of forest exploitation or it would bring the provincial government to court. As a rebuttal, the provincial government maintained its claim and criticized the MoF for inconsistent policies, citing rampant conversions of many forest areas for other purposes based on the MoF's decree. However, in the end, the provincial government conceded to the MoF and instructed the regency government to discontinue issuing permits until the policy conflict was settled. Up to the time of writing, negotiations between the provincial government and MoF is still ongoing. This experience has shown that opposing agencies have vested interests, which they use to justify their interpretations and actions. Hence, the legal discourse on forest management needs maximum clarity if is to succeed.

Carbon rights and conflict resolution

The local course of history has developed competing actors' power to claim carbon rights. Past recognition by the Dutch colonial government was adopted by local communities as part of land rights disputes. However, this reconstruction of rights depends to a large extent on power. To exert greater power to claim land, local communities sought recognition from village leaders through land ownership notification. Local communities also reconstructed their experiences during the forest concession era to claim certain rights in forest peatland. Acquiring rights was linked to labor and investment used for drainage works, in this case, but most of their claims also linked to social identity as customary people. Using such claims as customary people, the land that they use can 'legally' be regarded as a customary right. Customary rights are recognized through a Governor's Statement, Decree and Regulation and are used as their claim to the peatland area. Legal arguments are not always the decisive arguments in settling a dispute. Legal argument is only one of the discourses in which arguments can be found to sustain a claim, which was recognized by all disputants more clearly after the decentralization era in 1999. These arguments are mostly used, however, when government layers claim rights to control the Ex-MRP area. The decentralization policies changed the nature of power relations between the central and local governments. These policies and their legal acts influence on ongoing discourse between the central and local governments and reconfigurations of local property rights. Changing the local course of history requires changes in the balance of power, with formal rights only effective where these can be enforced. In this case study, rights, authorities and power are jointly determining carbon rights. Carbon markets require clarity of ownership as basis. Given the confusion and contestation, we can expect that a co-investment paradigm is feasible (van Noordwijk and Leimona, 2010) not a buyer-and-seller model.

The ASB Partnership for the Tropical Forest Margins is working to raise productivity and income of rural households in the humid tropics without increasing deforestation or undermining essential environmental services.

ASB is a consortium of over 90 international and national-level partners with an ecoregional focus on the forest-agriculture margins in the humid tropics, with benchmark sites in the western Amazon basin of Brazil and Peru, the Congo Basin forest in Cameroon, southern Philippines, northern Thailand, and the island of Sumatra in Indonesia.

The ASB Policybriefs series aims to deliver relevant, concise reading to key people whose decisions will make a difference to poverty reduction and environmental protection in the humid tropics.

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Contributors

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Attachment 2. Stewardship agreement to reduce emissions from de-forestation and degradation (REDD) in Indonesia. ASB Policy-brief 18

ASB Partnership for the Tropical Forest Margins

Policybrief 18

Stewardship Agreements to Reduce Emissions from Deforestation and Degradation (REDD) in Indonesia

Conflicts over who controls the forests and forest margins is now widely recognized as a key issue that needs to be addressed if the world wants to see a reduction of emissions from deforestation and degradation. Indonesia, the country with the highest carbon emissions from change in its forest cover, is now expressing global leadership in commitments to Nationally Appropriate Mitigation Actions (NAMA) that include forests, peatland and an increasing attention for the 'trees outside forest', in the form of agroforests and trees in agricultural landscapes. Agreements on stewardship in the forest margin are key to the success of such programs, but rules need to be simplified for wider application.

photo by Jasnari

Main findings

1. The recent designation of Lubuk Beringin as the first 'Hutan Desa' or 'Village Forest' came 10 years after the legal instrument was created, but offers prospects for wider use in conflict resolution on forest margins.

2. The procedures for application and approval of Hutan Desa status involve local, provincial and national levels of government and consequently only cases will pass that provide a net benefit at each level.

3. Expectations that resolving tenure conflict would facilitate flow of REDD investment to Indonesia facilitated approval of the first Hutan Desa case.

4. Lubuk Beringin was 'predisposed' to pioneer the Hutan Desa concept in Indonesia due to long term involvement with external agents building local social capital and aided by an informal forest discussion forum at the district capital.

Implications

- Increased tenure security for agroforests and community-managed forests is feasible within existing legal instruments in Indonesia and does not require new legislation.
- Wider application of the Hutan Desa concept will depend on a streamlining of procedures, learning from the first approval cases.
- Wider application of the Hutan Desa agreements can be a low-cost way for local people to benefit from REDD efforts, without requiring cash transfers.
- Impacts in governance and policy reform are unpredictable and carry over multiple project cycles with their often over-ambitious goals to finally achieve success in ways unforeseen.

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Success in forest protection and emission reduction (REDD) requires conflict resolution. The recent village forest (Hutan Desa) regulation by the Minister of Forestry (P.49/Menhut-II/2008) details how to reconcile forest management targets and livelihood interests of forest-edge villages within the framework of a permanent forest estate. Lubuk Beringin in Bungo district, Jambi province, became the first village in Indonesia to secure such an agreement. Recent analysis of process, stakes and social capital bridging local, district and national scales of Hutan Desa (Aklefnawati et al. 2010) aimed to assist in reducing transaction costs for wider application. Streamlining of rules is needed to make Hutan Desa a viable part of REDD schemes at relevant scale, to support locally appropriate mitigation action as part of national strategies and as co-investment in stewardship for local, national and global benefits.

Table 1: Specifications of Hutan Desa in government rule no. 6 of 2007 and government rule no. 3 of 2008

Rights and obligations	Management rights given to the village body include: a. The use of environmental services provided by, and of non timber forest resources derived from, watershed protection zone. b. The same plus the use of timber, subject to separate approval, in the production forest zone.
Work plan	At least once in a year the owner of the right reports the progress of the activities in the village forest, which include work plan, report on realisation of periodic activities, obstacles encountered and future planning.
Guidance and Control	Guidance and controlling village forest is carried out by Minister of Forestry, governor, the district head (or mayor in case of urban areas)
Termination of rights	Rights can be terminated based on results of a joint evaluation by the forest authorities and the body of village forest management.

It took 10 years to utilise the legal opportunity

The forestry law no. 41 of 1999 includes several options for co-management between forest authorities and local community groups or village entities. Wider use of the community-based agreements had stalled, while the village-forest rules were awaiting implementation decrees, till government rule no. 6 of 2007. Lubuk Beringin in Jambi became the first village to obtain this type of certificate on March 30, 2009.

Need for reducing transaction costs with simpler rules

The process of approval relates the forest to national and global interests in forest management via multiple steps, many of which effectively have a veto on village forest rules.

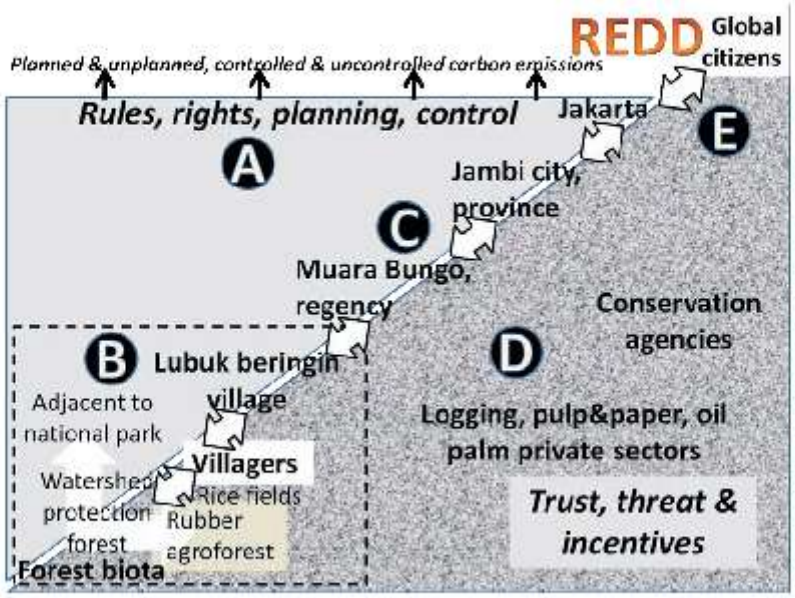

Figure 1: The various scales involved in an application and approval process

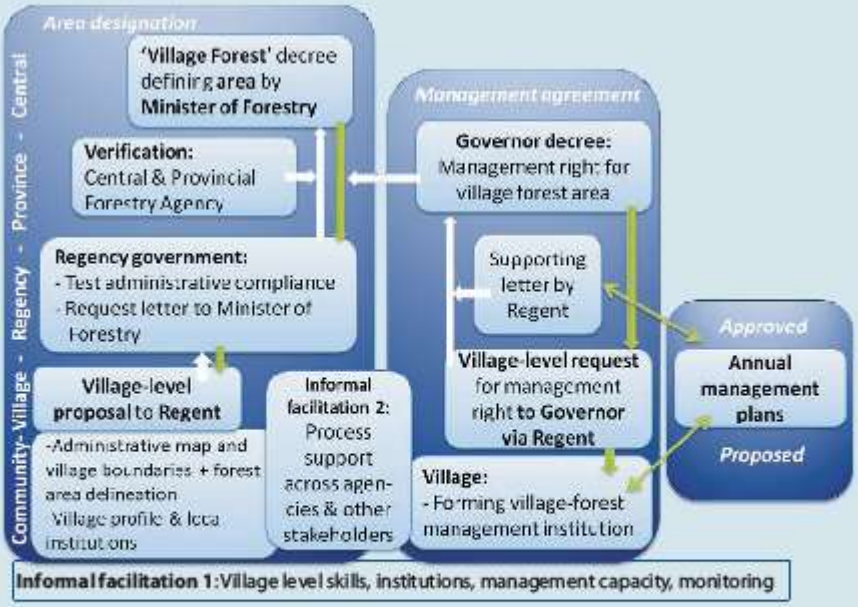

Figure 2: The proposal process

Further streamlining of the rules will be needed, making use of the legal precedent of the Lubuk Beringing permits.

REDD beneficiaries: fairness and efficiency combined

Analysis of the stakeholders along the approval value chain indicated that local level forestry and other government officials have been supportive of this type of conflict resolution, but at national scale approval had stalled as the supporters of 'social forestry' had less voice than the supporters of a concessionaire based wood industry. Active interest in tenure conflicts by the agencies developing REDD implementation probably tipped the balance in favour of supporting a village forest showcase. Wider application of the rules may depend on further signals that Indonesia's forest sector earns international support by dealing with long-term bottlenecks such as tenure conflicts.

Social capital: a long-term investment

A number of factors predisposed the village of Lubuk Beringin to become a pioneer in Hutan Desa application in Indonesia, but the village is not unique. Support by external agents for conservation and development agreements dates back to the Integrated Conservation Development Project of the Kerinci Seblat National Park in the 1990s. This project was deemed to have been a failure but it sowed the seeds of a local articulation of conservation interests that earned the village respect in local government circles. An active but informal network of local government officials interested in forestry issues at the district capital prepared the ground for administrative approval by discussing how rubber agroforests can perform forest functions and deserve policy support. An NGO active at local, provincial and national level assisted in the necessary 'bridging' forms of social capital, while international research agencies added credibility to local claims that environmental services can be maintained in a rubber agroforest context. Such a process of trust building, however, takes many years and cannot be readily substituted by fast track replication efforts. The existing case can, however, become a learning site for allaying fears of those involved in the approval process.

Figure 3. A sample of the various approvals and support letters needed

Next steps

Scaling out of the Hutan Desa concept to other villages within Bungo district is ongoing (two proposals are in the pipeline with the necessary maps and documents prepared with assistance by WARSI), while in neighbouring Merangin district a parallel process is near to its first success. Formal analysis of the case has resulted in a peer-reviewed publication, outlining questions for further exploration. Indonesia's national REDD+ strategy, to be released before end of 2010, identifies tenure issues as one of five underlying challenges to be tackled. The time is ripe for a big push forward on these issues.

Table 2: Tenure Transfer Policy Instrument

Policy Instrument	Application domain	Current status
Hutan Adat – recognition of traditional forest management and rights	None. Only limited recognition by regencies, but not by MoF. 1. Bungo, Jambi 2. West Lampung, Lampung 3. North Luwu, South Sulawesi 4. Kampar, Riau 5. Lebak, Banten	Several regency regulations recognize the existence of customary people and their rights, but these regulations need to be followed up by the Ministry of Forestry decrees that never been released, despite they are being addressed by the Forestry Law no. 41/1999.
Hutan Desa – village as active forest management unit	So far only 2300 ha in Lubuk Beringin Village, Bungo Regency, Jambi	The regency government is setting up several guidelines regarding on forest-collection for local communities.
Hutan Kemasyarakatan – community group with a forest management	Around 167,450 ha of forest zone are being implemented or considered for HKm rules. Cases include Lampung, Bengkulu, Yogyakarta, Bali, West and East Nusa Tenggara, South and South East Sulawesi, Gorontalo, South, West and East Kalimantan.	This stewardship is the most advanced compared to the other stewardship arrangements. However, in some cases, overlapping authorities and uncertain criteria on monitoring and evaluation of HKm have impeded the HKm progress.
Hutan Hak – privately or collectively owned forest	None.	Despite being mentioned in the Forestry Law and MoF Decrees, the rules and regulations that apply have not lead to any application.
Hutan Tanaman Rakyat – management contracts for industrial timber plantation plots	Targeted to have 5.4 million ha in 2009. The area for HTR covers Sumatera, Java (only Yogyakarta), Kalimantan, Sulawesi and Papua.	The intention of this stewardship is to promote wood-supply for pulp industries. The selected locations are mostly near pulp mills. The HTR rules imply the option of bank loans.

The ASB Partnership for the Tropical Forest Margins is working to raise productivity and income of rural households in the humid tropics without increasing deforestation or undermining essential environmental services.

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Attachment 3. Hot Spots of Confusion: Contested Policies and Competing Carbon Claims in the Peatlands of Central Kalimantan (Indonesia). International Forestry Review (in press)

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In the peatlands of Central Kalimantan, expectations of payments for reducing carbon emissions shape the discourse over natural resource management as a means of influencing policy and exercising power. Different types of actors have their own choice of argument and interpretation of facts, rules and norms over resource use or conservation. This article examines the discursive strategies used by contestants in the struggle over property rights in a failed development project ('ex-Mega Rice Area') in Central Kalimantan and traces their changes and developments in the justification for policy influence in the face of REDD[++] implementation. Shifting national policy priorities have affected the distribution of power that shapes the practice and use of forest peatland. The case study highlights the historical baggage of perceived injustice between state and local communities and the contest between national and provincial government authorities that complicates the debate on current efforts to mitigate climate change by emission reduction.

Keywords: discourse, decentralization, REDD, land tenure, carbon rights

INTRODUCTION

Indonesia is known as the country with the highest greenhouse gas emissions from land use and land cover change, with the third highest overall emissions and per capita emissions on a par with Europe (van Noordwijk *et al.* 2010). In September 2009, the President of Indonesia announced that Indonesia was committed to reduce net emissions by 26% by its own means below a '2020 baseline'. Indonesia also welcomed international co-investment to increase reductions by up to 41%, and in doing so effectively stabilize its emissions at 2005 levels. Consequently, Indonesia has become one of the prime targets for international efforts to reduce emissions from deforestation and forest degradation (REDD) in developing countries. The expectation of financial incentives for emission reduction has led to a debate on 'carbon rights' (Wemaere *et al.* 2009). The concept of carbon rights has instantly turned into a new arena for both contest and cooperation. Akiefnawati *et al*. (2010) described how

the central government expectations of qualifying for REDD funding facilitated recognition of local forest management rights in Indonesia.

Land ownership in many forest landscapes in Indonesia remains contested between the state and local communities (Tomich *et al.* 2002, Fay and Michon 2005, Kusters *et al.* 2007, Wunder *et al.* 2008). Emission reduction is measured as a change in carbon stocks over time, relative to an agreed baseline or expected change, after any corrections for leakage or displacement of emissions to other locations. These alone, demand clarity and procedural justice if the 'legal basis' of property rights and governance over forested land and resources is to be resolved (Cotula and Mayer 2009, Unruh 2008). The interaction of these various 'carbon rights', with existing or emerging rights, authorities and power over land use decisions is not easily understood. Land 'ownership' is only one of several elements influencing the feasible levels of emission reduction. Key issues in the REDD debate on carbon rights are: 1) who has, or can claim the right to cause carbon emissions ('emission rights'); 2) who has, or can claim the right to ask for co-investment in emission reduction efforts ; 3) who has, or can claim the right to receive payments for avoided damage to local or global environmental values ('sell foregone carbon emission rights'); 4) who has the right to agree on or set a baseline of 'business as usual' or 'emission rights'; and 5) who has the right to measure and verify carbon stocks and determine 'additionality' and 'leakage'? The contest for these rights has led to a power struggle for authority among the government layers in many countries (Phelps *et al.* 2010).

Hence, 'carbon rights' come as an addition to the already complex layers of unresolved property rights. The complexity extends from the relationship between individuals and local communities, between both of these and local government, between sub-national entities and Indonesia as a state, and in Indonesia's relations with global negotiation platforms on mitigating climate change. At the international level, efforts to reduce emissions from peatlands (only part of which are 'forest' by current international definitions) are a step beyond the current REDD+ agreement (UNFCCC 2010) to support policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries and are also beyond the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries. Inclusion of peatland requires a broadening from REDD+ to REDD^{++} (van Noordwijk *et al.* 2010), but as long as bilateral support can be obtained and reduction of peatland emissions is part of Indonesia's national appropriate mitigation action, this issue can stay in the background. As part of a site-level feasibility study for REDD+(+) activities in the Central Kalimantan ex-Mega Rice Area, one of the recognized hotspots of carbon emissions in Indonesia, we found that the 'legal' basis of contesting claims referred to historical injustice and 'rights', and to the use of current contradictions and inconsistencies of laws and multi-sector policies, interacting with differences of interpretation, the shifting power relationship of disputants and articulation of local property rights and the rights of customary people. The area thus provides a case study of the complexity that needs to be dealt with to start with a clean slate in efforts to provide for local livelihoods, while reducing emissions to contribute to global emission reduction goals. This article examines the discursive strategies in the struggle over property rights in the Central Kalimantan ex-Mega Rice Area and traces changes and developments in the justification for this influence in the face of REDD+(+) implementation. After a review of property rights and the theory of discourse analysis, we provide an overview of the study site and the survey methods used. The results are presented in a historical time frame,

tracing the entry of various current contestants. The study analyzes the links between the way land use access history is portrayed and the dynamics of property rights and policies on forest access and use, the question of legality in areas designated functionally to remain as forests, and the social and political implication to resource users.

PROPERTY RIGHTS AND THEORY OF DISCOURSE

Property relationships can take many different forms. Schlager and Ostrom (1992) distinguished five types of property rights operating at two decision-making levels: operational and collective-choice. The complete bundle of rights includes the ability to access, withdraw, manage, exclude and alienate a resource. Policies attribute them into use rights, disposal rights and access rights (Gerber *et al.* 2009). However, in many cases, rights specified in property laws and regulations as *de jure* or by legal right do not always match actual, *de facto,* property rights. Actors can be said to hold actual powers if legal rights and actual rights mutually reinforce each other (Thanh and Sikor 2006, Yandle 2007). Nevertheless, it leads also to the question of who invokes *de facto* rights or actual rights. Ribot and Peluso (2003) developed a 'Theory of Access', defining access as the ability to benefit from resources and interpreting it as a bundle of property rights that provided actual power based on various mechanisms, processes and social relations, not confined to the 'legality' of the claims. Some of the factors influence the 'costs' of making a claim and enforcing it, others influence the expected benefits from using the resource (Figure 1). Expected benefits from resource use as well as costs of enforcement jointly determine whether or not it is worthwhile for an actor to pursue a claim.

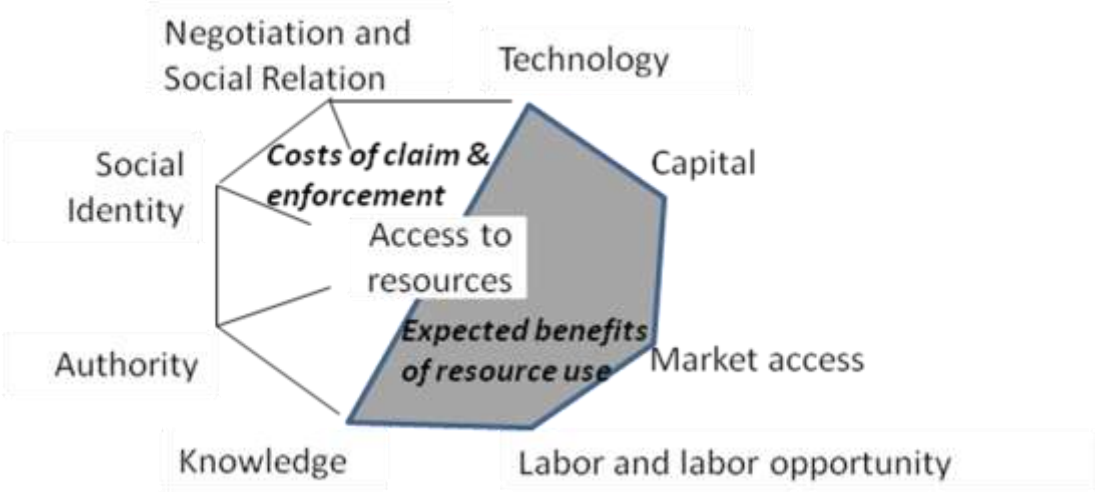

Figure 1. Theory of Access, with factors influencing costs of making a claim and enforcing it and factors influencing expected benefits from resource use (modified from Ribot and Peluso, 2003)

Discourse strategies of actors play an important role in the ability to influence and determine socially constructed power relations (Foucault 1978, Medina *et al.* 2009). A discourse can be defined, following Hajer (1995), as a specific assemblage of ideas, concepts, and categorization that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities. It contributes to a construction of certain values and goals as more worthy than others, identifies particular institutions as primary actors in a policy issue and attributes authority to certain bodies of knowledge over others (MacDonald 2003). Three key elements are found

in this definition: first, a specific set of ideas, concepts and categorization, second, the fact that these are being produced, reproduced and transformed into a set of practices, and third that we make sense of what we see and experience through them (Tennekes 2005).

Arts and Buizer (2009) distinguished and summarized four types of discourse approaches. Discourse as *communication* is often associated with discussion, debate or an exchange of views with regard to a certain societal or political topic. Discourse as *text* influences how a certain language or conversation is written and interpreted. Discourse as *frame* is informed by present knowledge, beliefs and values. Finally, discourse as *social practice* disciplines human agencies to think, speak and act in a certain way and not otherwise. Policy studies on discursive strategies in the struggle over property rights have focused on 'stories' (Fortmann 1995, Bridgman and Barry 2002), historical context (Biezeveld 2004), scientific assessments (Galudra and Sirait 2009), legal arguments (Turk 1978, van Langenberg 1990), language expression (Swaffield 1998) or combinations of several of these. Biezeveld (2004), for example, described how historical context and legal concepts were reinterpreted and defined by different groups involved in land disputes in West Sumatra, by framing their arguments in the vocabulary of the other party. Groups used their knowledge of different interpretations of historical events to negotiate current access. Such discursive strategies can change rapidly as a result of the political and economic situation (Doolittle 2001). Nevertheless, discourse can constitute indispensable resources with the potential to both enhance an individual actor's negotiating power and to create opportunities for compromise (Arevalo and Ros-Tonen 2009).

OVERVIEW OF THE STUDY SITE

Located in three regencies—namely, Pulang Pisau, Kapuas and South Barito, the peat domes of the Central Kalimantan Ex-Mega Rice Area, cover around 1.5 million ha on the interfluves of a number of rivers (Figure 2). Around 80% or 1.27 million ha of this area are classified as peatland, most of which have been affected by human use in recent decades. These rivers have a long history of human use, with a string of settlements and a tradition of upstream-downstream mobility of various ethnic groups, practicing 'swiddens' along with shifting village locations. Ownership claims on some parts of the riverbanks and hinterland depend on the details of the settlement history. During the colonial era, *de facto* use of the riverbanks was sanctioned by the government, but after independence the Republic of Indonesia claimed ownership of, and control over all land and resources for the benefit of the People of Indonesia. However, when the State started granting permits for logging concessions in designated forest areas, *de jure* concessions clashed with the *de facto* use rights of local people.

The construction of drainage canals for the Mega Rice Project and the establishment of transmigration settlements have not only brought a new influx of migrants with land ownership claims, but also altered the institutional arrangements and property rights of existing local communities. The Mega Rice Project was based on deep drainage, 'salvage logging', land clearing, transmigration of villages involving farmers from outside the area and irrigated rice. The few independent experts who had advised against the project were correct; it provided economic benefits through logging and for the suppliers of the heavy equipment needed, but not for the rice farmers, many of whom started looking for other employment. The Mega Rice Project shifted the existing property rights in the area into what had been considered to be an open-access regime. As a consequence, villagers began competing amongst themselves to gain access to natural resources.

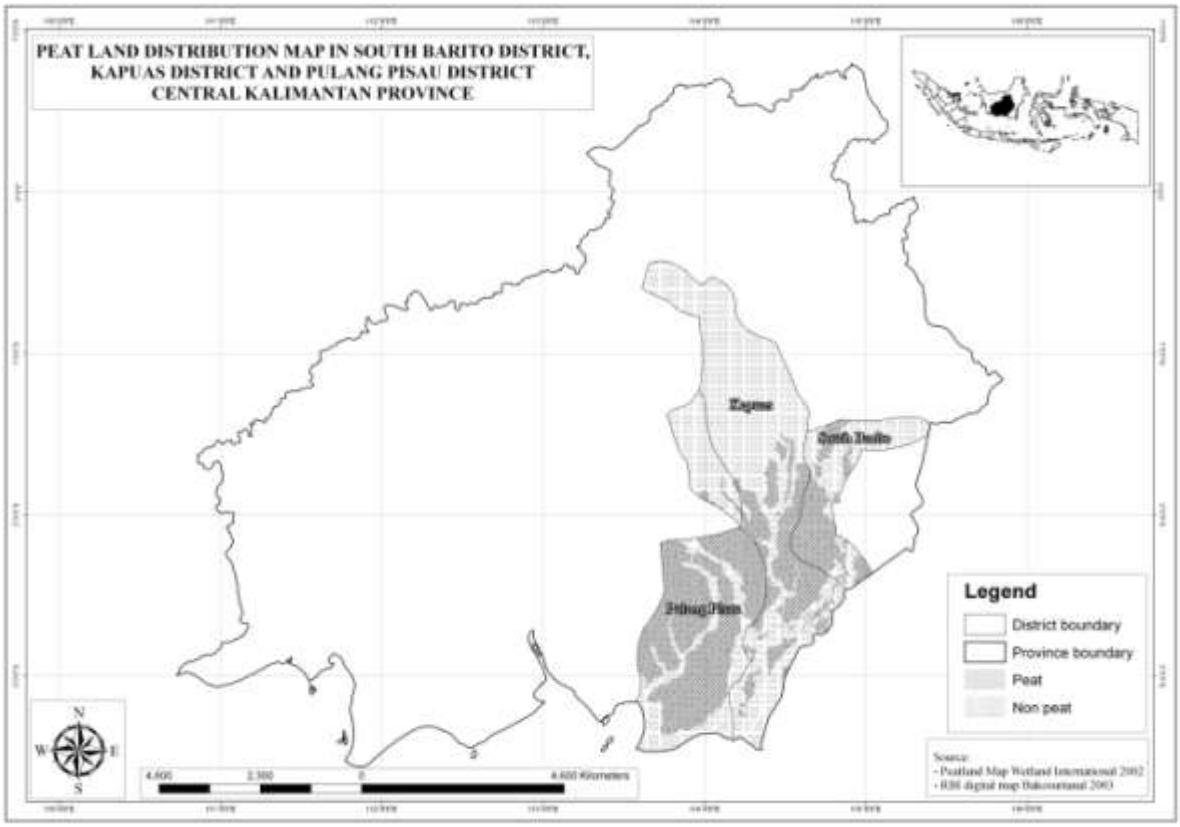

Figure 2 The Peat Domes of Central Kalimantan around Ex-Mega Rice Area

Confusion and the contest over rights worsened during the 1997/1998 'forest fire' episode that hit the area. The event widened the attention on government policies on land use. The forest fire was interpreted as a result of a combination of El Niño conditions causing a prolonged dry season, and the increased vulnerability of peatland resulting from drainage and logging. Before the fall of the Soeharto regime, the Ministry of Environment publicly displayed pictures of the canals in the Mega Rice Project area as the source of smoke and haze - this exposed Indonesia to its neighbors, causing embarrassment in terms of the extent of the health hazard the fire caused. The extent of carbon release into the Indonesian atmosphere was estimated to be between 0.81 and 2.57 Gt - this is equivalent to 13–40% of the mean annual global carbon emissions from fossil fuels, which contributed greatly to the largest annual increase in atmospheric CO_2 concentration detected (Page *et al.* 2002). These episodes of fire events forced the government to close the Mega Rice Project (which then became known as the 'ex-Mega Rice Project') and to consider it a "mega disaster". Since then, efforts have focused on rehabilitating the area. However, these efforts were challenged by the local government that was pursuing local economic development through oil palm plantations as an attractive option rather than through rice production. Adding to this contest, the local communities began to protect their ancestral claim as the efforts of both layers of government were perceived as threats to their 'rights'. The restriction of long-term land use options by each actor has created conflicts for those who have asserted claims to the land.

While the international rules on REDD+ are not yet clear and emissions from peatlands may or may not be covered, there is increasing consensus that this type of

emission reduction is technically feasible, urgent (high emissions) and probably cost effective. It is explicitly mentioned as part of the Letter of Intent between Indonesia and Norway signed in 2010. Several donors and international organizations are exploring and seeking effective ways of reducing emissions in this area as a part of the goal to bring peatland emissions into the emerging REDD schemes.

METHOD

Data collection was undertaken from 2009 to 2010. Key informant interviews were conducted with policy makers in Jakarta, Palangkaraya (Central Kalimantan Province) and Kuala Kapuas (Kapuas District). Researchers also immersed in 14 settlements within the ex-Mega Rice Project Area to observe the daily life of local communities. Detailed analyses of property rights in each settlement, with reference to different actors, forest resources, types of rights, and layers of social organization were undertaken. The relevant rights included the rights to withdraw timber, withdraw non-timber forest products (NTFPs), convert forest into agricultural fields, construct drains and access to rivers, and exclude others from using the forest and drainage. For convenience, the study design was patterned after the study on peatlands by Adger and Lutrell (2000). Three specific sets of issues were explored:

1. The nature and history of property rights and forest use claims.
2. The discursive strategies of disputants to exert their claims to rights.
3. Factors causing the dynamic and multiple claims on property rights.

Focus group discussions and semi-structured interviews were conducted with informal leaders, heads of local customary institutions, former village heads and other villagers, and representatives from local governments, forestry agencies, and local NGO workers. Each focus group discussion and interview consisted of 8–10 community leaders and elders in each settlement. They were interviewed to understand how different actors used discourses and how these discourses shaped their rights claims and forest use practices. The interviews explored the potential of negotiations to reach agreement on how to use the peatland forests, the arguments used by the different actors, the final agreements and their implementation. In addition, the study searched for examples where the communities managed to get their own rights acknowledged and identified the circumstances under which this occurred. In meetings with local government and central government officers, special attention was paid to how those actors harnessed their own discourses to put forward claims and the outcomes of these efforts. These were supplemented with a range of other sources, including newspaper stories, government reports, and reports from conservation agencies, NGOs and individual consultants, as well as the Dutch Colonial texts on the area. By using policy content analysis, formal and informal land tenure was better understood from the collection of policies and laws. Direct observation also helped to deepen the understanding of policy implementation and local land tenure.

Five stages in the historical development of the discourse were used to present the findings of the study: 1) pre-independence or colonial rule (before 1945); 2) after independence (1945-1965); 3) new order (1966-1998); 4) decentralization (post 1999); and 5) recentralization (post 2006).

RESULTS AND DISCUSSION

The Resurgence and Demise of Customary Law and Land Rights

From pre-colonial to colonial days

The interface with global trade and local resource use in Kalimantan during the last two millennia followed a pattern of coastal kingdoms with limited control over the upstream area where local institutions and ethnic identities could develop. In Central Kalimantan, the emerging village structure level recognized the *Damang* (a customary council) as a customary judicial institution. After the war negotiations in 1894 and 1928, the Dutch colonial rule legalized and expanded this role to issuing land use rights to the local communities and households. Following recognition, the customary institution issued rights to local communities and households. Several customary land-use rights are still recognized as follows:

1. *Eka malan manan satiar* – the right of a local community to hunt animals, to open the forest for swidden rice cultivation system, and to collect non-timber forest products. The area, designated as land used by the community typically covered 5 km around the community settlement.
2. *Kaleka* - an ancient customary community settlement that had been abandoned and returned to secondary forest. The area was considered a sacred area and determined as having communal customary land rights status.
3. *Petak bahu* - an ex-swidden that has been returned to (agro)forest. Only the previous cultivator, based on former rights (*hak terdahulu*), could use and collect the forest products.
4. *Pahewan/ tajahan* and *sepan* are sacred forest areas, where the local community had rights and obligations to protect the areas from any land use activity.
5. *Beje* is a fish pond made by the local community to trap and store fish during the dry season. The pond may be owned either privately or communally.
6. *Handil/tatas* is the right of a local community to construct small drains to open up land for shifting cultivation or to collect timber and non-timber forest products in forested land, and for fishing.

From independence to 'new order'

In the initial period following the independence of the Republik Indonesia in 1945, the *de facto* status of local rights was still recognized. However, the emergence in 1965 of the 'New Order' shifted power to the central government, leading to the demise of *de facto* rights.

During Soeharto's reign from 1965 to 1998, the government granted permits to international and national companies to exploit vast areas of forested land, despite concerns over issues and unsettled questions on how the State law should take into account customary land-use rights. In the early 1970s, the Agrarian Affairs Office investigated the status of customary land-use rights in Central Kalimantan and concluded that customary institutions had already diminished, leaving local people with vague or no land use rights.

However, several scholars remained convinced that despite the decreasing legitimacy of customary institutions and the pervasive conversion from communal to private lands, local communities had remained faithful in their practice of customary laws (Abdurahman 1996, Mahadi 1978, Yanmarto 1997). The government, however, adhered to the Basic Agrarian Law of 1960, which states that customary land-use rights could only be recognized if there was an existing customary institution governing the community; the

absence of a recognized customary institution was used to justify the issuance of 'concessionary permits' by the central government.

In 1982, the government enacted the 1982 Forest Allotment Consensus (*Tata Guna Hutan Kesepakatan*) that classified 15.3 million ha of forested lands in Central Kalimantan as state forest land under the administration of the Ministry of Forestry (MoF). The enforcement of this forest classification remains disputed even today (Contreras-Hermosilla and Fay 2005). Several notes[1] issued by different ministries instructed the governor and the local land administration to support this new so-called "consensus". These policies, consequently, abolished all local rules and regulations that related to local land rights recognition and laid a strong basis for logging companies to operate on the forested lands in Central Kalimantan. Logging companies were invoked by a government regulation to exercise power to terminate local land-use rights[2], in pursuit of a timber-centric policy that was intended to generate economic benefits for the central government. Correspondingly, the customary communities were obligated to secure clearance from logging companies to use their land[3]. During this period, power was almost solely held in the hands of the State, which had vested economic interests in logging concessions, allowing them to finally gain full control over the lives of customary communities, and pushing them to gradually withdraw their land-use rights.

In 1995, the government allocated 715 945 ha of forest lands in the study area to 12 forest concessions. This period marked the demise of customary sovereignty and the rise of power-holding forest concessions. However, the concessions in this area were only short-lived as the government eventually decided to allocate the area for the Mega Rice Project (MRP).

The MRP aimed to convert logged-over peat forest into paddy rice fields, through a network of canals and to introduce Javanese production systems through transmigration of people from outside the area. One of the major reasons for the implementation of this project was that the area was considered 'state land' and thus to be free of land claims and rights held by the local communities. The government believed that converting the land use and changing the land status of the area would not create any problems, but certainly, this was not the case on the ground.

Vast areas of forest were cut to implement the project, causing periodic forest fires. Areas that were used by many communities for rattan forest, sacred forest, *beje,* and shifting cultivation were destroyed during the process. However, community protests and demonstrations had started to escalate in 1997 and 1999. More open and braver expression of the peoples' sentiments heightened during the period of '*Reformasi*' that marked the end of the 'New Order' in 1998, and the return to democracy. In 2001, the Kapuas Government Regency ordered the National Land Agency at the regent level and other regency government offices to inventory all community land uses that had been exploited by the MRP, and authorized them to give communities fair compensation for the loss of their land. However, the government only inventoried and compensated those that were within 90 to 150 m from the banks of the MRP drainage canals. This was a big disappointment to local communities, who had been using the land far beyond these distances, and especially as the

[1] Ministry of Home Affairs No. 26/1982 dated 13 May 1982 and Ministry of Agrarian Affairs No. 586/1982 dated 17 July 1982.
[2] Government Regulation No 21/1970 and No 28/1985.
[3] Ministry of Agriculture Decree No. 749/ 1974, Ministry of Forestry Decree No. 194/ 1986 and No. 251/ 1993.

Provincial National Land Agency in 2003 had acknowledged community land use and occupation beyond the compensated area.

The inventory process was difficult as many of the natural boundaries that were used to delineate areas under community land use had been destroyed by the construction of the MRP canals. Conflict surrounding this issue remains unsettled and communities are still demanding that the government provide just compensation for the damage inflicted by the loss of their land use rights. For local communities, the MRP resulted not only in the loss of their livelihood, but also in insecurity of resource access and use rights.

Decentralization and Its Aftermath

After the end of Soeharto's reign, the central government decided to stop the MRP permanently and devolved management responsibilities to provincial governments. This heralded the commencement of a period of 'decentralization'. Central government handed down certain power and authority over forestry affairs to Regency heads (*bupati*). Law 22/1999, on regional administration, and Law 25/1999, on fiscal balancing between the central government and the regions, were issued to support greater autonomy of regency governments to formulate policies and obtain a larger share of forest revenues. When these policies came into effect in January 2001, the Kapuas Regency Government was quick to issue as many small-scale concession permits as possible, and started to impose charges on existing companies.

During this period, the *bupati* and the governor were allowed to grant annual timber harvesting permits of 100 ha and small forest concessions of 10 000 ha to private land owners, communities and customary forest owners. The area of the ex-MRP at that time was then subjected to further loss of forest cover and degradation of forest quality, as around 70 small forest concessions operated and harvested around 12 million m^3 of logs in the area – in other words, the unintended ill-effect of decentralizing forest management was to accelerate deforestation.

Under massive and fierce criticism of the 'deforestation' and 'illegal logging' that was taking place, the Ministry of Forestry (MoF), in June 2002, withdrew the authority of the regency head to issue small scale concession permits and effectively reaffirmed its perceived authority over forest matters through a number of decrees and regulations[4]. These regulations restored the authority of the MoF to issue new forestry concessions – a role that was previously given to, and apparently misconstrued and ill-performed by local governments. However, none of the regulations that emerged swiftly during this period included the ex-MRP management issues, especially regarding the allocation of rights. It was as if the MRP issue and the damage it had created had been completely forgotten and the excision from forest areas and transfer to local government authority was considered to have been illegal in the first place.

However, the cancellation of power did not stop local governments from using the areas for their own interest. After the return of the power to allocate small forest concessions from the regency to central government, the local government resorted to different regulations to exploit the remaining good forest cover. In 2003, a provincial regulation[5] was issued on provincial spatial planning, which legally supported the Regency to use and allocate forest lands for oil palm plantations and mining exploration. After the

[4] Government Regulation No 34/2002, MoF Decree No 541/2002, No 6886/2002, No P 03/2005, and No P 07/2005.

[5] Provincial Government Regulation No 8/2003.

failure of rice, oil palm production in 'already' deforested lands was seen as the best way to fuel the local economy and raise local government revenue. Around 369 000 ha of the (ex) Mega Rice Area were assigned to 37 oil palm concessions, while about 41 536 ha were allocated for 60 coal mining concessions. Interestingly, both permits overlapped causing confusion to concessionaires.

The post-MRP era also marked the beginning of the 'recognition' of customary institutions. The regency government enacted several regulations[6] that recognized the existence of customary institutions (*kadamangan*), assigned them with governance roles, and recognized their basic rights, including customary land use rights. However, the Governor's Decree was not clear on the territorial issue of customary land-use rights. In 1998, the Governor of Central Kalimantan province released a statement that a distance of 5 km from the river banks should be given back to communities under customary land-use rights. However, this statement offered no legal guarantee of protection for customary land-use rights. In such a period of policy confusion, land use rights became an arena for contesting multiple claims as everyone had their own interpretation of who should rule and use the land in the ex-MRP area.

In 2007, the central government passed Presidential Decree No. 2/2007, stipulating the management and allocation of the ex-MRP areas for conservation, rehabilitation and plantation. To support this initiative, the MoF in 2008 passed Decree No 55/2008 that contained a master plan for conservation and rehabilitation of peatlands for 10 years (2007-2017). The two decrees manifested full control by the central government over the area by placing it under its own conservation and rehabilitation program. However, these efforts certainly overlapped with the interests of local government. Under these new decrees, only a small amount of the area could be allocated for crop-estate plantation, with 10 000 ha for oil palm and 7 500 ha for rubber plantations, compared with the 2003 Central Kalimantan Spatial Development Plans Regulation, which allocated around 369 000 ha for oil palm and 41 536 ha for mining. On the other hand, around 897 000 ha of peatland were targeted by the central government for rehabilitation and restoration.

Due to this national policy, the regency government revoked several oil palm concession permits through Decree No 89/2009, an action supported by the provincial government note No 525/05/EK dated 20 January 2009. Concessionaires who acquired land permits from the Regency and local land administration before the statement of the provincial government were allowed to continue their operations[7]. Meanwhile, some cancelled concessionaires claimed that they had already been legalized by the MoF.

The local communities, after the MRP cessation, began to use the abandoned land for cultivation through *handel* and *tatah* rights dating back to the forest concession era. When they heard that their cultivation areas had been allocated to oil palm concessions by the regency government, members of the local communities raced to strengthen their claims over land by receiving land ownership notification from the head of their village. Unfortunately, many such actions caused conflict between villagers because they were issued without considering village boundaries.

[6] Provincial Government Regulation No 14/1998, No 16/2008 and Central Kalimantan Governor Decree No 13/2009.

[7] Law No. 18/2004; Ministry of Agriculture Regulation No. 26/2007; Central Kalimantan Provincial Regulation No. 3/2003; Central Kalimantan Provincial Regulation No. 154/2004; Kapuas Regency Government Regulation No. 10/2003.

Resistance of the Provincial Government and its Discourse after Recentralization

The aftermath of decentralization was not an easy task for the central government to control as the provincial and regency governments as well as local communities had claims over the forest peatland. The policy adopted by the provincial government to exploit the ex-MRP area was in contrast with the recent central government policy. The provincial government claimed scientific support for its position with reference to a study by the Agricultural Research and Development Office in 1998, showing that around 327 853 ha and 345 340 ha of the ex-Mega Rice Project were considered suitable for oil palm cultivation and rubber plantations, respectively. This study certainly influenced the provincial government policy and was clearly in line with its interests.

Besides scientific support, the provincial government used the MoF's Note No 778/VIII-KP/2000 to argue their 'legal claim' over the exploitation of the ex-MRP for oil palm and mining concessions. The Note provided a legal basis for the provincial government to convert state forest lands into other land use system, as long as conversion was accompanied with spatial developments plans. However in 2006, the central government issued an MoF Note[8], which superseded the previous Note, and demanded seizure of all concessions permits issued by the provincial government since 2000. The Note also deemed the 2003 spatial planning regulation of the provincial government illegal.

The provincial government defended its decision, since many oil palm concessions were already in operation. The provincial government issued a Note[9], explicating that the spatial development plan, which had been rendered illegal by the MoF had been harmoniously processed with consent, and in conjunction with the forest land use map (TGHK) of the MoF—this too was supported and approved by the Ministry of Home Affairs[10]. After presenting these facts, the provincial government accused the MoF of unreasonably and irresponsibly rendering the 2003 spatial planning regulation illegal.

The MoF reacted to the provincial government's management claim over the ex-MRP area by claiming it could not be treated as 'final' since there had not been a forest designation decree. Once again, the MoF ruled against the legality of the 2003 spatial planning regulation, determining that it couldn't be used as a legal basis for converting the forest status and exploiting the ex-MRP area for oil palm and mining concessions[11]. The conflict of authority between the Central Kalimantan Provincial Government and the MoF created much confusion at the regency government level; the provincial government insisted that the regency government continue applying the 2003 spatial planning regulation, as a basis for exploiting the forest, including the project area, and to ignore the MoF's demands[12].

The MoF was challenged by the aggressive actions of the provincial government, and exacted the termination of forest exploitation threatening to bring the provincial government to court[13]. As a rebuttal, the provincial government held to its claim and criticized the MoF for inconsistent policies, citing rampant conversions of many forest areas for other purposes based on the MoF's Decree[14]. However, in the end, the provincial

[8] Ministry of Forestry Note No S.575/Menhut-II/2006 dated 11 September 2006.
[9] Governor of Central Kalimantan Note No 126/1809/Ek dated 2 November 2006.
[10] See Ministry of Home Affair Decree No 68/1994, Ministry of Forestry Decree No 1189/Menhut-VII/1995 and No 1212/Menhut-VII/1995, Ministry of Home Affair Note `No 050/2301/Bangda dated 25 September 1996, and Governor of Central Kalimantan Decree No 008/054/IV/BAPP.
[11] Ministry of Forestry Note No S-776/Menhut-II/2006 dated 22 December 2006.
[12] See Governor of Central Kalimantan Note No 522/010/Ek dated 3 January 2007.
[13] Ministry of Forestry Note No S.225/Menhut-II/2007 dated 13 April 2007.
[14] Governor of Central Kalimantan Note No 522.11/1084/Ek dated 3 July 2007.

government conceded to the MoF and instructed the regency government to discontinue the issuance of permits until the policy conflict was settled[15]. At the time of the present study, the negotiations between the provincial government and MoF are still ongoing. This experience has shown that opposing agencies have vested interests, which they use to justify their interpretations and actions. The legal discourse on forest management needs maximum clarity if it is to succeed.

Changes in Property Rights and Carbon Rights Insecurity

The dynamics of forest allocation and land use change in the ex-MRP area not only changed the existing property rights, but also put customary institutions into disarray and created higher-level conflict among multiple stakeholders. The introduction of political and administrative decentralization in 1999 significantly increased the authority of district and provincial governments over natural resources (Palmer and Engel, 2007; Wollenberg *et al.*, 2004). However, in Central Kalimantan, forest decentralization was short-lived, with the central government taking back power from the provincial government after realizing how the vast forest resources could be used to exact political and economic power. However, one indicator of success within this short period was the fervor of the provincial government in asserting the legitimacy of its decision—a condition that extended the on-going legal 'tug-of-war' between the central and provincial governments. Furthermore, decentralization influenced the changes in the distribution of actual rights and practices around forests, and the discourse that it is today.

The ambivalence of forest definition and property rights institutions is an artifact of the historical change of government laws and public administration; as government regulations change, so do the actual rights and practices of local communities and state bodies and with growing attention to carbon markets, the issue of 'carbon rights' has added another layer of confusion to property rights. This situation is not however, unique to Indonesia. Ali and Hoque (2009) found shifting policies instigated ownership disputes and altered property rights and governance of forest resources in Bangladesh.

Carbon rights in the present case study are at least as complex as the set of actors and agents that interact during the process that starts with a natural forest and ends with a landscape with few trees but high carbon stock. Along this process, many actors and agents have *de jure* and *de facto* rights, power and authority, and all are stakeholders based on the benefits currently derived from 'business as usual'. Landscape dynamics determine the dynamics and changes of actors and claims to use the area. Here, the carbon rights under the context of REDD are interpreted by the central government as 'economic use' of 'rights to not-use' the physical research. Access to these new property rights enhances rather than reduces the conflict over natural resources.

The local course of history has developed the power of competing actors to claim carbon rights. Reconstruction of the past recognition by the Dutch Colonial government has been adopted and used by local communities as part of the land rights dispute. However, this reconstruction of the land rights in communities will certainly depend to a large extent on power. To exert greater power to claim the land, the local communities sought recognition from the village leaders through land ownership notification.

The local communities also reconstructed their past experience during the forest concession era to claim certain rights in forest peatland. Acquiring rights was linked to labor

[15] Governor of Central Kalimantan Note No 522.11/1089/Ek dated 3 July 2007.

and investment used for drainage works in this case, but most of their claim was also linked to the social identity as customary people. Using such a claim as customary people, the land that they can use 'legally' could be regarded as being covered by customary rights. The customary rights are recognized through the governor's statement, decree and regulation and such recognition has been used to support their claim to use and access the peatland area. Nevertheless, the decree and regulation do not actually stipulate what the customary rights are and which customary rights are being recognized, causing confusion as to how they can be integrated with the forest law. Scientific arguments are also used as part of these discursive strategies, but they are mostly dominated by government institutions.

Legal arguments are not always decisive in settling a dispute. Legal argument is only one of the discourses used to sustain a claim and was recognized by all disputants more clearly after the decentralization era in 1999. These arguments are mostly used, however, when government layers lay claim to rights to control the ex-MRP area. The outcomes of decentralization policies changed the nature of the power relations between the central and local government. These policies and their legal acts influence ongoing discourse regarding the contest of rights between the central and local government, and reconfigurations of

Table 1 What type of resource use?

Resource use	Swidden + fishing and non timber forest product economy	Logging and associated extractive industry	Conversion to agriculture Rice	Rubber + oil palm plantation	Carbon-stock protection and restoration in peatlands: REDD^{++}
Proponent	Traditional and local communities	Ministry of Forestry before 1995	Central government before 1998	Migrant population and local government (oil palm component)	Central govern-ment + Ministry of Forestry after 2007
Current debate	⇩	X	X	⇩	⇩
Current discourse	"Communities are customary (*Adat*) people with traditi-onal rights and ownership to the land, trees and water" "Customary (*Adat*) rights are being protected and recognized since the Dutch and now by local government "	X	X	"The area had been reserved for food estate purpose based on MoF No 166/1996" "Oil palm plantation can provide labor opportunities for people, especially for transmigration"	"Peatland must be conserved and protected from any land-use as it historically caused periodic forest fire"

local property rights. Legal discourse dominates the debate between the provincial and central government not only with respect to ex-MRP management schemes, but also regarding the authority to rule the area. Discourse on what types of natural resource use were suitable in the area led both parties to use their authority to rule the area. Both government institutions employed these prevailing discourses to achieve their objectives.

This issue is particularly relevant to the ex-MRP area where peatland forest management is the subject of intense debate among actors each with a different understanding of how to use the resources and who can use them. The expected benefits from labor and labor opportunity were used by the local government to claim the area for oil-palm plantation (See Table 1). Changing the local course of history requires changes in the balance of power with formal rights only effective where these can be enforced. In this case study, rights, authorities and power are jointly determining carbon rights.

CONCLUSION

The ex-MRP area has become a hotspot not only for CO_2 emissions, but for 'confusion' regarding who holds the right to make decisions over how and who can use the area. The confusion stemmed from historical struggles over property rights between customary communities and the central and local government. The discourse over property rights is shaped by the way in which individual actors and agencies use power to defend their own interpretation of changing forest management regimes. This discourse was used as a means to exact power over the contest for property rights. Local people have used their life histories in their struggle for legal recognition of customary property rights as invoked by their Dutch ancestors, whereas the central and local governments have used their positions in society to legalize their legal interpretations of management regimes. However, as a less-powerful actor, local people are often predisposed to yield power to authorities, and tend to resign easily from the action arena, leaving the legal discourse in the hands of the central and local government. Decentralization has played a significant role in empowering local governments to exert their rights and obligations, and to share power with the central government. The Central Kalimantan provincial government was firm in its legal discourse, to rule the ex-MRP area despite being severally overruled by central government. The discursive means used by the state and local actors have been subjected to scrutiny by other stakeholders, with multiple types of knowledge (for example, scientific knowledge) being sought to unravel the mess of factors impinging the discourse over property rights. The ongoing dispute over who has the right to use and manage the ex-MRP area is crucial in the face of REDD negotiations. Nevertheless, carbon rights could not only be de-linked from existing or emerging rights, but also be de-linked from the authorities and power.

The international relevance of this case stems in part from the global importance of Indonesia's peatland emissions and the pioneering role of the REDD+(+) implementation in this country. The relevance of a historical perspective that acknowledges the perceived injustice to local stakeholders stemming from the 'resource extraction' phase of governmental development planning, mirrors the claims that industrialized nations have a historical carbon debt towards developing nations and need to act accordingly. Nation states such as Indonesia have to adjust their discourse when addressing local rather than international partners.

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Attachment 4. Stewardship agreement to reduce emissions from deforestation and degradation (REDD): case study from Lubuk Beringin's Hutan Desa, Jambi Province, Sumatra, Indonesia. International Forestry Review 12, 349-360.

Stewardship agreement to Reduce Emissions from Deforestation and Degradation (REDD): case study from Lubuk Beringin's *Hutan Desa*, Jambi Province, Sumatra, Indonesia

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SUMMARY

Contested rules between the state and local communities over use and protection of forest affect environmental services and livelihood options in Indonesia's forest margins. Success in forest protection and emission reduction (REDD) requires conflict resolution. The recent village forest (*Hutan Desa*) regulation by the Minister of Forestry (P.49/Menhut-II/2008) details how to reconcile forest management targets and livelihood interests of forest-edge villages within the framework of a permanent forest estate. Lubuk Beringin in Bungo District, Jambi Province became the first village in Indonesia to secure such an agreement. Our analysis of process, stakes and social capital bridging local, district and national scales of *Hutan Desa* aims to assist in reducing transaction costs for wider application. Streamlining of rules is needed to make *Hutan Desa* a viable part of REDD schemes at relevant scale, and to support locally appropriate mitigation action as part of national strategies, and as co-investment in stewardship for local, national and global benefits.

Keywords: action research, community forest management, *Hutan Desa*, REDD+, village forest

Accord de gestion pour réduire les émissions résultant le déboisement et la dégradation (REDD): étude cas de Hutan Desa du Lubuk Beringin, dans la province Jambi, Sumatra, Indonésie

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Les règles contestées entre l' état et les communautés locales concernant l'utilisation et la protection des forêts affecte les services environnementaux et les options de sources de revenu dans les marges forestières de l'Indonésie. Un succès dans la protection forestière et la réductions des émissions (Redd) requiert une résolution des conflits. La règle récente dans le village de forêt (Hutan Desa) promue par le ministère de la foresterie (p.49/Menhut-II/2008) détaille une réconciliation des buts de la gestion forestière et les intérêts des revenus des villages à l'orée de la forêt dans le cadre d'une propriété forestière permanente. Lubuk Beringin, dans le district Bungo de la province Jambi est devenu le premier village en Indonésie à sécuriser un tel accord. Notre analyse du processus , des potentiels et du capital social, faisant pont entre les échelles locale, de district et nationale des Hutan Desa cherche à assister à la réduction des coûts de transaction pour une application plus générale. Un affinement des règles est nécessaire pour faire de Hutan Desa une partie viable des projets de REDD à une échelle appropriée , et pour soutenir des actions de mitigation appropriées légalement comme section des stratégies nationales, et comme co-investissement dans la gestion pour les bénéfices local, national et global.

Acuerdo de gestión sostenible para la Reducción de las Emisiones derivadas de la Deforestación y la Degradación de los bosques (REDD): el caso de Lubuk Hutan Desa Beringin, en la provincia de Jambi, Sumatra (Indonesia)

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El desacuerdo entre el estado y las comunidades locales en cuanto a la regulación del uso y de la protección de los bosques afecta los

servicios ambientales y las opciones para ganar el sustento en las zonas marginales de los bosques indonesios. El éxito en la protección del bosque y en la reducción de emisiones (REDD) depende de la resolución de conflictos. El reglamento reciente del Ministro de la Silvicultura sobre la gestión forestal en las aldeas (*Hutan Desa*, P.49/Menhut-II/2008) expone en detalle cómo reconciliar los objetivos de gestión forestal y los medios de vida de las aldeas vecinas dentro del marco de una zona forestal permanente. Recientemente la aldea de Lubuk Beringin en el distrito de Bungo (provincia de Jambi) llegó a ser el primer pueblo de Indonesia donde se logró un acuerdo de estas características. Nuestro análisis del proceso, de los intereses y de la forma en que el capital social salvaba las diferencias locales, distritales y nacionales de *Hutan Desa* tiene como objetivo ayudar a reducir los costos de la operación en nuevas aplicaciones a mayor escala. Hace falta un proceso de racionalización de los reglamentos para que *Hutan Desa* llegue a ser una parte viable de los programas de REDD a una escala relevante, y para apoyar acciones de mitigación apropiadas al lugar como parte de una estrategia nacional, además de como co-inversión en la gestión sostenible para lograr beneficios locales, nacionales y mundiales.

INTRODUCTION

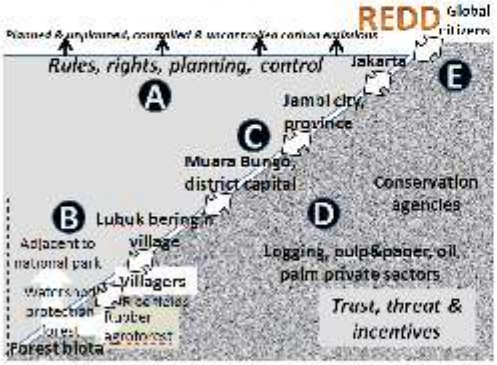
Reducing Emissions from Deforestation and Degradation, or REDD, is a goal statement with a clear performance criterion embedded, which can be achieved in multiple ways. Much of the public debate has focussed on financial incentives as the core of REDD policies (Angelsen *et al*. 2009, Stern 2008, Verchot and Petkova 2009). Expectations of financial gain have created interest in many of the policy and governance layers involved, but have also created conflicts, and an array of bargaining positions. Beyond finance, early debates on REDD (IFCA 2007; Karsenty *et al*. 2008) recognized the need for substantive reform of forest policy and of the interaction between government agencies, local stakeholders and the private sector if the goals of emission reduction are to be achieved. Where lack of clarity of customary and statutory rights or the conflict between different perspectives on such rights are at the root of ongoing deforestation and degradation, the contest for dominance over financial flows may make matters worse rather than better. Resolving conflicts and clarifying rights may switch the land use change and emission trajectory of a landscape at very low cost, and thus be an important part of a national REDD strategy. Within the REDD debate, efficiency and fairness angles are recognised (Suyanto *et al*. 2009). Efficiency focuses on current threat and associated bargaining positions, and fairness on matters concerning medium-to-long-term threat, enhancement and maintenance of trust. While the efficiency perspective tends to focus on flows of financial capital, the fairness perspective converges on investment in assets, linking social, human, natural and financial capital.

REDD is often seen as a form of (or at least closely related to) Payments for Environmental Services (PES). van Noordwijk and Leimona (2010) distinguished three paradigms within the broad term of PES: (1) commoditization of environmental services (e.g. via C-offset and credit markets, payment on delivery), (2) compensation for opportunities skipped (e.g. the forest maintenance payments in Costa Rica with weak conditionality) and (3) co-investment in stewardship (e.g. investing across multiple capitals, sharing risk, expressing shared responsibility). Preconditions of the first two paradigms are clarity of property rights at the start of the process, and statutory legality of activities that threaten environmental services and enforcement of laws that set minimum standards of behaviour. The third paradigm is feasible where any of the preconditions of the first and second paradigm are not met. van Noordwijk and Leimona (2010) claim that the opportunities for co-investment in stewardship are therefore much more widespread than those for the other two paradigms. A historical analysis of the PES concept (Gomez-Baggethun *et al*. 2010) leads to a similar conclusion. It is also aligned with the German and Keeler (2010) perspective on hybrid institutions that combine the formal and informal in shaping more productive engagements with seemingly intractable natural resource management challenges at farm and landscape scales.

A case study of conflict resolution in the form of *Hutan Desa* agreements is described here, as a low-cost but essential precursor for REDD schemes. Indonesia is not only leader in terrestrial C-emissions (Ekadinata *et al*. 2010), it is also a leader in commitment to Nationally Appropriate Mitigation Action (NAMA) as a basis for building global trust and achieving global cooperation to manage climate change. As described, this first actual *Hutan Desa* agreement in Indonesia was itself facilitated by expectations of REDD benefit flowing to government agencies that effectively have a veto on any agreement and which generally had little interest in moving such agreements along before REDD entered the debate.

This paper traces the nesting of scales (Fig. 1) and starts with a description of the underlying rules and associated conflicts over planning and control over forests in Indonesia (section A), followed by an account of the Lubuk Beringin village in its local context (section B). The emergence of new rules for reconciling the interests of such a village with those of national forest authorities in the form of *Hutan Desa* is presented (section C), together with the process that had to be followed to obtain the first such permit. Then, (section D) the emergence of the *Hutan Desa* agreement for Lubuk Beringin is discussed in the context of trust, threats and incentives, answering the question "Are there specific exceptionally favourable factors in the present condition or past history of Lubuk Beringin that pre-disposed the village to be the pioneer of a new deal between forest authorities and village communities in Indonesia?". The relevance of this case for the REDD debate in Indonesia is discussed in the final section (E).

FIGURE 1 *Schematic representation of the cross scale relations between a specific forest-village gradient, nested in a regency (district), province, country and global network of relations that can be understood in a formal (rules, rights and planning; upper triangle) and informal sense (e.g. trust, threat and incentives; lower triangle). (Note: Letters A to E are the sections of this paper).*



THE POLICY CONTEXT AND CONFLICTING RIGHTS

In Indonesia, as in most countries in the Asia-Pacific and elsewhere, the right to use, manage and/or convert natural forest is, by constitution, vested in the state for the benefit of the people. In practice, the perspectives of the state and local communities on how such benefits could be achieved have differed and varied over time (Fay and Michon 2005). The historical basis of the state's claim over all natural resources varies within Indonesia, given the patchwork of governance arrangements and agreements with local rulers that the colonial government left behind (Galudra and Sirait 2009). Jambi province (Sumatra) was brought under colonial rule only in 1908. At that time, nearly all fertile land accessible by river, which was the major means of transport, was already occupied and used for agriculture. Only land in the mountains (which later would become the Kerinci Seblat, Bukit Tigapuluh and Bukit Duabelas National Parks) and peat swamp forests and in the mangrove belts remained unclaimed, available and later became firmly established protection forest zones. The remaining forests on the lowland peneplains which were beyond reach of the villages at the time of colonial rule were established as forest reserves. After Indonesia's independence in the 1960s road access was established and those lowland dipterocarp forests and also the peat swamp forests were assigned to logging concessions.

In the early 1990's the Kerinci Seblat National Park (KSNP), the largest protected area in Sumatra, was the target of what was supposed to become an exemplary Integrated Conservation and Development Project (ICDP)[1]. The project was closed in 2002, as evaluations suggested that its goals were not achieved. An impact study by Helmi and Yonariza (2002) compared villages that were involved in the project with those villages outside and concluded that the ICDP achieved the objectives on conservation awareness but failed to match the rate of development through alternative livelihood options. Ironically, the ICDP failed at its core by the lack of integration, contrary to its name, and because it remained a project. The various service delivery sectors were not aligned despite participatory mechanism. There was no effective support for the villagers to guard the park when confronted with outsiders who intrude the forest through their village. Further, the conservation grant disbursement increased inequity and sparked jealousies. The project failed in its social components, and in this ICDP does not stand alone in the world. But such shortcomings through failures in project design and implementation must not slow or stop the search for real integration of conservation and development through other means (Pfundt *et al.* 2008). Local, national and global stakes in the outcome are high and the situation is clearly in need of more effective ways towards reconciliation.

Attempts at fully rights-based approaches were futile generally in pre-1998 Indonesia, and accordingly in Jambi and Sumatra. The subject was at that time totally elusive, mainly because of the lack of universally accepted baseline and point of reference agreements on the types of rights, claims and resource use, usufruct and associated benefit-sharing which were not yet finally negotiated. Elsewhere in Sumatra, substantive shifts towards tenure security were achieved and started to have positive effects for both livelihoods and environmental services, even though these fell short of clarifying all rights to mutual agreement (Kusters *et al.* 2007, Suyanto *et al.* 2005).

The 1998 political change in Indonesia altered the playing field, though not necessarily the actors and stakes. The Indonesian Forestry Law No. 41 of 1999 contains a number of mechanisms, including privately owned forest (*Hutan Hak*), forest areas with recognition of traditional rights (*Hutan Adat*), community-based forest management (*Hutan KeMasyarakatan or HKM*) and village forest management (*Hutan Desa*). These mechanisms could be applied to forests that have permanent watershed protection status (*Hutan Lindung*) and forests that could be subjected to sustainable logging practices or severely degraded areas for forest plantation development (including *Hutan Tanaman Rakyat* or HTR). However, between the legal opportunity and a fully functional implementation program, many intermediate steps need to be taken to align forest governance agencies at district, province and national levels. Until implementation rules had been established, eight years after Law 41 came into effect, no forest had been formally designated as *Hutan Desa*.

The 1999 forestry law was influenced by the decentralisation concepts of the 1998 Refomasi period in Indonesian politics. The mood in the forest sector rapidly swung back towards recentralization in 2002. Djogo and Syaf (2003) reflected the general sentiment that decentralization had allowed for opportunistic behaviour and delegation of power to the private sector rather than

[1] World Bank sponsored project.

good forest governance, and that hence recentralization was necessary. The alternative view that decentralisation had not been carried through to relevant local scales (Colfer *et al.*, 2008) did not gain wide acceptance in policy circles.

Increasingly over the past decade, international concerns over the fate of tropical rainforests, driven by concerns for biodiversity as well as greenhouse gas emissions and climate change, focused on issues of governance and control of illegal logging. More direct involvement of local communities is widely seen as an important, even essential part of any solution. The discussion on REDD that started in Indonesia ahead of the UNFCCC's 13th Conference of Parties in Bali in 2007 re-emphasised the need to reduce conflict over forest boundaries and engage local communities in forest management and conservation (IFCA 2007, van Noordwijk *et al*. 2008). The people and representatives of Jambi province were keen to be among the pioneers in emerging REDD programmes and this provided support at provincial level for moving ahead with new initiatives for local forest governance.

LUBUK BERINGIN: FOREST-VILLAGE GRADIENT AND SOCIAL CAPITAL

Lubuk Beringin, with a total area of 2,800 hectares of which 84% is classified as watershed protection forest bordering the KSNP (Kerinci Seblat National Park) for the english translation of Taman Nacional Kerinci Seblat (TNKS), is one of the villages in the Sub-District Bathin III Ulu, Bungo District, Jambi province, Sumatra. By official Indonesian standards it is rated as a poor village within the district, with below-average income levels. The village's main sources of food are its rice paddies and the main source of income is rubber (*Hevea brasiliensis*) and occasionally durian and other fruits obtained from the rubber agroforests that also provide fruits and medicinal plants. While technically feasible, the intensification of rubber gardens involves risks of failure and requires credit sources at reduced discount rate, not locally available (Joshi *et al*. 2003, Williams *et al* 2001).

In 1997 the village became part of the ICDP-TNKS program which aimed to develop an agreement of village rules on environmental preservation. The agreement included maintaining of forest areas; non-opening of lands with more than 30 degrees slope; and planting of bamboo along the riverside to protect the slope from erosion and landslides.

Lubuk Beringin is part of the Rantau pandan valley. From here, the project Rewarding Upland Poor for Environmental Services (RUPES)[2] of the World Agroforestry Centre (ICRAF) explored rewards for environmental services in Bungo District after the closure of the ICDP-KSNP programme. It included Lubuk Beringin as one of the focal villages, building on some of the social capital that had been achieved in the ICDP days, but relying on local initiative of the village people. As the rubber agroforests of Lubuk Beringin border on and are partly classified as watershed protection forest (*Hutan Lindung*; it is likely that most rubber gardens preceded the designation of forest into this category), the key issues for the village were their lack of tenure security and options, and authority to deal with external disturbance to the forest upstream. As one of the RUPES sites, the project had been successful in supporting and scaling up the use of the Community-based Forest Management (HKM) procedures of the Forest Law, and a similar approach seemed also appropriate for Lubuk Beringin. At central government level, however, the HKM option was seen as losing control, partly because the relations between community groups and formal government are not clearly stated in the forest law, even at the lowest level.

RUPES-Bungo activities are focused on the options for jungle rubber or biodiversity-friendly rubber agroforest management (Kuncoro *et al*. 2006). These activities raised local awareness of the various tradeoffs involved in intensifying rubber cultivation, that is, while rubber yields increase, the locally created public goods and services from the agroforest system decline. The village discussed the relevance of protecting their existing rubber agroforestry systems. Rubber agroforests also serve as the habitat of fauna and flora and can preserve watershed functions. Since the village is not yet connected to the electricity grid, the idea came up to use the local river as a source of hydropower. The RUPES project supported the idea, as a direct reward for environmental services and a way to increase local incentives to protect the watershed. The local government later stepped in and provided further support. The village's efforts were finally recognized by winning the second place for the prestigious national Kalpataru award in 2006 at provincial level, and as the top candidate in 2007. Thus, the visibility of the village was amplified and its commitment to combine conservation and livelihood improvement was strengthened.

The Lubuk Beringin villagers have committed themselves to the conservation and protection of the Rantau Bayur protected forest area. The driving motives are to utilise the forest functions, especially that the forest provides the water to generate electricity for their village, to irrigate their rice field, and to supply their domestic needs, especially for drinking water. A village rule (PERDUS) guides their efforts to manage the water and utilize the forest both for timber, non-timber products and non – product services. The rules and villagers forbid land clearing and people campaign for this by providing information in the mosque. The main threat to the forest, however, comes from the neighbouring villages and their development pathways. These neighbouring villages have agreements with private companies for oil palm development and implement local transmigration programmes to increase their population.

C1. FORMAL RULES FOR *HUTAN DESA*

Government Rule No 6 of 2007 and Government Rule No 3 of 2008 stipulate that forest management needs to be

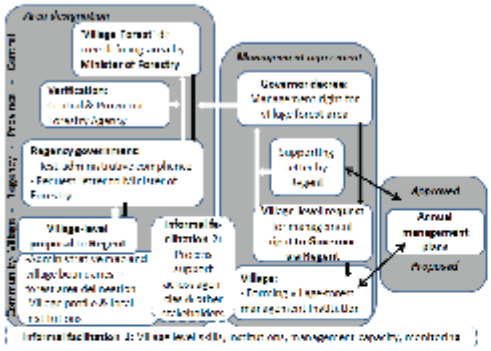
[2] RUPES is a programme funded by International Fund for Agricultural Development (IFAD).

based on empowering society, developing local capacity and skills and providing access, in order to increase prosperity of people living in or around the forest. The village forest or *Hutan Desa* option was clarified along with Community-Based Forest Management (HKM).

Hutan Desa areas are considered to be part of the national forest estate managed by the village community through a local village organization that plans, manages and allocates benefits derived from the forest. The management is not exclusively focused on utilization of forest resources, but includes responsibilities to preserve the life-supporting functions of the forest. The procedure for assigning rights to any village in Indonesia involves approval at district, provincial and national levels (Figure 2). The designation of the *Hutan Desa* became operational under the decree from the Minister of Forestry No. P. 49/Menhut-II/2008 of August 25, 2008.

The area which can become a *Hutan Desa* has to be administratively part of the village and can include watershed protection forest and production forest (as long as there are no existing concession rights). The permission of *Hutan Desa* is valid for 35 years and is renewable for another 35 years subject to approval of annual work plans. Detailed information about rights and obligations, work plans and other duties within the *Hutan Desa* scheme are presented in Table 1.

FIGURE 2 *The scheme of proposing area designation, management rights and annual management plans for a village forest; approval requirements imply that stakeholders at multiple levels weigh trust, threat and incentives as they perceive them and final agreements require net benefits for all involved*



C2. OBTAINING *HUTAN DESA* RECOGNITION FOR LUBUK BERINGIN

In early January 2009, a verification team from the forestry department visited Lubuk Beringin for a feasibility study. Then during a ceremony attended by 2000 people on March 30, 2009, the Minister of Forestry officially awarded the *Hutan Desa* management rights to Lubuk Beringin. The village became the first in Indonesia to obtain such rights. The head of Bungo district received the decree from the Minister on behalf of the village. The forestry and plantation office was designated to guide the village in the course of implementing their *Hutan Desa* work plan. On the otherhand, the village community is charged with the reponsibility to monitor and report illegal logging activities in the area to the relevant authorities.

The external support that the village obtained in initiating, supporting and acquiring the *Hutan desa* permit was a form of Action Research (Bargal 2006) in the sense that researchers were actively involved together with the villagers and used arising opportunities throughout the process. Researcher-supported local action proceeded in a stepwise fashion, with phases of reflection alternating phases of action and 'learning loops' (Table 2). The reflective process of the involved villagers and researchers was influenced by their understanding of history, culture and local context and embedded in social relationships between them, as has been found in other action research applications (Baum *et al* 2006).

D. DISCUSSION: UNDERSTANDING TRUST, THREAT AND INCENTIVES

Community coherence and connectedness

The answer to the question "Are there specific exceptionally favourable factors in the present condition or past history of Lubuk Beringin that pre-disposed the village to be the pioneer of a new deal between forest authorities and village communities in Indonesia?" is decidedly 'no'. Conditions were favourable but not exceptional.

For more than a decade, Lubuk Beringin has been interacting with the NGO KKI-WARSI in the ICDP-KSNP's protection programme which eventually failed. However, although the ICDP as a whole may have failed (as described in section B), the process it started affected the Lubuk Beringin area positively and its traces are noticeable in the Lubuk Beringin's *Hutan Desa* scheme and outcome to this day. Suparman (1999) noted that the empowerment programmes of the ICDP reached only the rural elites. In the case of Lubuk Beringin, however, at least the participation in the discussions ultimately involved all members of the social pyramid. The time pressure and speed in the project's progress may have been unusual and may not match common reality. Therefore assessments and forecasts in this respect have to be cautious and success or failure must in no case be judged too early.

The RUPES program on biodiversity and environmental services reward options also employed participatory, collaborative and co-learning approaches. It operated on the basic assumption that effective management of natural resources, including biodiversity conservation, occurs whenever there is synergy among human, natural, and social capitals (van Noordwijk *et al.* 2004). Social capital in Lubuk

TABLE 1 *Specifications of Hutan Desa in Government Rule No 6 of 2007 and Government Rule No 3 of 2008*

Rights and obligations	Management rights given to the village body include: a. The use of environmental services provided by and of non timber forest resources derived from watershed protection zone. b. The same plus the use of timber, subject to IUPHHK approval, in the production forest zone. The obligations are: a. Marking the border of the working area. b. Submitting annual work plans c. Protecting the remaining forest from outside agents. d. Carrying out and arranging the business of utilizing forest resources. e. Paying forest use fees and contributing to the reforestation fund (in case of logging) in line with the rule of law.
Work plan	At least once in a year the owner of the right reports the progress of the activities in the village forest which include: a. Work plan and the realization of periodic activities: • Marking the border of working area • Planting • Cultivating • Obtaining benefits • Protecting b. Obstacles in the implementation: • Technically • Administratively c. Future planning
Guidance and Control	Guidance and controlling village forest is carried out by Minister of Forestry, Governor, the District Head (or Mayor in case of urban areas) Support provided for Village Forests from the Central Government through provincial forest agencies include: a. Education and training in managing forest b. Developing the local management entity c. Guidance of arranging work plan of village forest d. Technical guidance of managing forest e. Information on market and access to capital f. Developing of business capacity
Termination of rights	Rights can be terminated based on results of a joint evaluation by the forest authorities and the body of village forest management. Rights are terminated if: a. The 35-year period expires. b. Failure to meet the agreed objectives justifies sanctions. c. The holder of the rights decided to withdraw.

Beringin village was developed using an interactive co-learning approach which allowed dialogue among as many relevant stakeholders as possible to share knowledge, define problems and find solutions. The community was considered as a key collaborator for having an active role in designing and deciding target priorities while the outsiders had the responsibility in actualizing the process of conservation and development. Reaffirming the hypothesis of Ostrom (1990) that self organization defines the community, the following principles were applied in terms of: 1) the boundary of the village territory was clearly defined in the Lubuk Beringin landscape taking account of the historical facts (i.e. elders wisdom and old maps), and 2) the community affected by the rules participated in modifying the rules (i.e. PERDUS).

Win-win-win solution?

Popular expectations of triple bottomline benefits for planet, people and profit of REDD need to be tempered by the harsher reality. Analysis of the various benefits that the district, provincial and central government agencies derived from the *Hutan Desa* designation suggests that the public discussion of conflicts as deterrent of REDD investment in Indonesia as a whole and in Jambi province specifically have played a role. Although the REDD context is not reflected in the formal decisions (as it might give the impression of undue external international pressure in a domestic policy issue), it was expressed in informal interviews with those involved in the approval. Financially, a designation as watershed protection forest is not interesting for the forest managers: such status does not allow extraction rents while the costs of protecting the area are a drain on district resources. These

TABLE 2 *Planning, action and reflection phases of the external facilitation of the Village Forest application, using participatory action research concepts*

Planning 1: ▪ Discussion of the village leaders and village society. ▪ Establishing a committee for managing village forest. ▪ Completing the require-ments of proposing village forest together with facilitators. ▪ Discussion with the neigh-bouring village leaders to settle the borders of the forest.	Action 1: ▪ A committee was founded with the name "Ndendang Buluh Sako Batang Buat"; M. Mukhlis became its leader. ▪ Proposal letters to delineate and manage village forest were sent to the head of district Bungo, assisted by KKI-WARSI.	Reflection 1: ▪ The Head of District agreed to the proposal of the society of Lubuk Beringin village and ordered the Forest and Plantation Office to check the data in accordance to the proposal. The Society actively helped the staff of Forest and Platation Office to complete the requirements of proposal. ▪ The neighboring village society helped marking the village borders.
Planning 2: ▪ Preparation of Village Forest work plan by the committee.	Action 2: ▪ A verification team of the Forestry Department visited the village. ▪ The working area for the village forest was confirmed and the committee for the Village forest established its track record.	Reflection 2: ▪ The Head of Bungo District received the right for using Forest Village from Forest Ministry (MS. Kaban). ▪ The Head of Bungo District gave the responsibility to the Forest Village Management Committee to maintain and use forest village.
Planning 3: ▪ Cultivation of orchid, honey bee, and other non-timber products ▪ Increasing rubber cultivation in the forest village to reduce the dependency of the society on the forest. ▪ Planting of (indigenuous) trees to enhance the biodiversity of the forest. ▪ Propose a program of developing village to get aid from the government. ▪ Make pole/sign of border helped by forestry and plantation office.	Action 3: ▪ Forestry and plantation office actively and positively respond to the work plan ▪ Planting rubber in the area of village farms (so far 10 hectare).	Reflection 3: ▪ Society keeps informing the status at the same time reports the neighboring village for sanctions if they cut down trees in the area of the village forest. ▪ Shares experiences with the society outside of the village. ▪ Receives the award from the Forestry Minister as a Village for Conservation.

costs are supposedly balanced, in a public policy perspective, by gains in more regular flow regimes and reduced risk of landslides that might disturb road infrastructure or can lead to loss of lives. Transferring responsibility for protection of watershed forests to the local community may thus involve net benefits for the local forest authorities. Politically, this modest economic gain for the forestry department by reducing its cost and not losing income may be used for further gain.

Bungo's forest governance learning group (FGLG) served as a venue to have open discussions for the activist aiming at reforming forest governance. This forum is informal and the topics of the discussion depend on initiatives from the members. The members of the forum do not represent their institutions, so the meetings provide a safe and free space for learning.

The relevance of the REDD debate for the emergence of *Hutan Desa* agreements has been analysed and the results are presented in Table 3. The analyses are based on the discussions with various stakeholders at the national, provincial, regency or district and local scales. Stakeholders' position relative to such stewardship agreements was estimated by multiplying a simple score of positive, neutral or negative impacts on their group interest and a 5-point ranking of the 'clout' or perceived power to facilitate or delay the approval. Given the multilayer type of approval process and scarcity of opportunities to tradeoffs across different issues between governance layers (as opposed to within each layer), it may be reasonable to expect that the net outcome has to be at least neutral at each layer of governance, before agreement can be achieved. In the table, the situation with and without REDD expectations were reconstructed. Without (or before) REDD expectations, the national and provincial discussions may have tended towards blocking the proposal, as the influence groups that expect these proposals to hinder the allocation of forests to the forest industry had more influence than the social forestry influence group. The REDD debate may have tipped the balance at both central and provincial level, as expectations of benefit flows were voiced by the diverse parties and interest groups. Interestingly, in this analysis the major interest groups opposed to such agreements could not openly express opposition for this case, as it involves watershed protection forest that is out of reach for the forest industry (even though de facto use of such lands as source of

TABLE 3 *Analysis of stakeholder positions and power at local, regency, provincial and national scale, based on 'expert opinion' of those involved in the process; the overall score at each level is calculated with and without expectations of REDD benefits*

		Net benefit	Clout	REDD related?	Open?	Influence on decision			
						With REDD	w/o REDD	Silencing illegal voices With w/o REDD	
Scale	Stakeholders	A	B	C	D	A*B	A*B*(1-C)	A*B*D	A*B* (1-C)*D
National	Ministry of Forestry (MOF) Pulpwood supply interests	-1	5	0	0	-5	-5	0	0
	MOF Social Forestry interests	1	2.5	0	1	2.5	2.5	2.5	2.5
	MOF REDD interests	1	3	1	1	3	0	3	0
Province	Provincial Pulpwood supply interests	-1	2	0	0	-2	-2	0	0
	Provincial water flow interests	1	1	0	1	1	1	1	1
	Provincial REDD interests	1	1	1	1	1	0	1	0
Regency	Regent	1	5	0	1	0	0	0	0
	Regency forestry law enforcement unit	1	2	0	1	1	1	1	1
	Opportunity to collect revenue for forest use	2	2	0	1	4	4	4	4
	National park authority	1	2	0	1	2	2	2	2
Village	Village leadership	2	2	0	1	3	3	3	3
	Well-off farmers (foregoing rubber intensification)	0	2	0	1	0	0	0	0
	Local operators of illegal loggers	-2	1	0	0	-2	-2	0	0
	Women and children	1	1	0	1	1	1	1	1
	Local hydropower operators and participating households	1	1	0	1	0.5	0.5	0.5	0.5
External	Provincial NGO	1	2	0	1	4	4	4	4
	International research centre	2	1	0	1	2	2	2	2
Totals				Sum at National scale		0.5	-2.5	5.5	2.5
				Sum at Provincial scale		0	-1	2	1
				Sum at Regency scale		5	5	5	5
				Sum at Village scale		2.5	2.5	4.5	4.5
				External stakeholders		8	8	8	8

raw material for the industry has been possible). Similarly, at village and district levels the groups currently benefitting from illegal logging could not openly express their position.

Role of external agents

External agents interacted with the local community for over a decade, and a detailed attribution of how components of this influenced the quality of self organized forest governance is beyond the scope of current analysis. In Bungo District, as mentioned by local government staff, the close interaction of local community with NGOs as facilitator has been very important (Adnan *et al.* 2008). Community development program of NGOs provided technical expertise, facilitated information exchange with other rural communities and created a forum for conflict resolution. However, local action also requires legal backing in efforts of dealing with outside agents (e.g. involved in illegal logging) and to achieve reciprocity with municipal government. The active roles of ICRAF and KKI-WARSI in the district-level forest learning group, and of WARSI at provincial level were helping to build trust in the village community and in helping forest officials understand that rubber agroforests indeed combine environmental and productivity functions that are compatible with the watershed protection forest status (Joshi *et al.* 2003).

E. RELEVANCE OF INCREASING COMMUNITY FOREST DESIGNATION FOR THE INTERNATIONAL REDD DEBATE

The draft of Indonesia's national REDD+ implementation strategy (released for discussion in September 2010) includes tenure issues as one of five categories of causes of deforestation and forest degradation that need to be addressed in Indonesia, along with weak spatial planning, ineffective forest management, weak governance and unfair benefit distribution from the forestry sector, and weak law enforcement. The tenure issues listed include lack of clarity on forest area and boundaries, lack of recognition of local rights and limited options for alternative livelihoods in forest margins. Conflicts over the role of controlling area and natural resources caused by unclear tenurial rights must be finalized through a serious attempt in a clear action strategy. The specific opportunity for wider application of the *Hutan Desa* construction is yet to be more widely discussed in this REDD+ implementation strategy, but interest is increasing.

One of the key challenges of the country in participating REDD schemes is the transaction costs it incurs in planning, implementing and delivering actions that will avoid emissions which would be expected in a business as usual scenario. Estimates of global average costs provide very little guidance since conditions within any given country may well differ substantially from the average (Pagiola and Bosquet 2009). Varying social conditions is one of the many factors. This will affect especially on transaction costs necessary for parties to a transaction involving a REDD payment, monitoring, reporting and verifying the tons of emission reductions. Setting up clear boundaries and statutory rights through *Hutan Desa* in Lubuk Beringin is a way to reduce the possible transaction costs between the national government and the communities. Substantial streamlining of the rules and reduction of transaction costs appears to be possible.

The designation as village forest of 2 392 hectares of 84% of Lubuk Beringin's territory can be a step towards inducing and encouraging other schemes in neighbouring villages or in the whole Rantau pandan valley and/or region surrounding the national park. The question arises after the conditions and causal factors which helped to make Lubuk Beringin so special that it could win the top position as pioneer in the REDD programme by the *Hutan Desa* agreement. During the struggle for this status the community had to endure massive discouraging and unfavourable comments from outsiders, even voices in the forestry institutions who habitually are inclined to mistrust any local community. If peculiarly favourable and unique circumstances had prevailed and were responsible, it would be less than likely that the success of Lubuk Beringin could easily be repeated and the result of the *Huta Desa* project could be simply transferred to other villages.

The feasibility of the validity or otherwise of the hypothesis that transaction costs can be reduced by using the same or adapted tactics and strategies as in the success stories once there are adequate numbers and kinds of success stories available for scrutiny and as blue-prints to point out in local and inter-institutional debates and negotiations, is currently being explored. Processes of replication have been started in Bukit Panjang, Bukit Pohong in Sungai Telang, Bukit Singirik up to Bukit Rantau Bayur in Senamat Ulu village. These contiguous areas are all within the protected forest area of Bukit Panjang-Rantau Bayur, covering 13,529 hectares. The new policy of larger agreement areas provides for much larger area than the previous arbitrarily low limit of the maximum of 1,000 ha for customary forest in Bungo district (Endah 2008, Hadi *et al.* 2008). The current agreements reach one or two orders of magnitude higher than that – but still stay several orders of magnitude below the potential size of relevance to the communities. The replication of the *Hutan Desa* scheme in these areas can be a model of collective management of forest areas involving various villages under a clear government regulation.

The newly acquired security of tenure is a most precious achievement for the villagers of Lubuk Beringin. It is a highly valued reward for their tenacious efforts, but also a challenge and responsibility to deliver high-level performance in forest protection, conservation and management. In as far as the approval of forest authorities has been linked to expectations of REDD funding the benefits for local communities can, for a change, have preceded benefits at government level. Much of current REDD debate is about benefit sharing focussed on financial flows. The key to the success of Lubuk Beringin is that two principal multiple currencies are involved: the principal primary benefit to the community is security of rights and opportunities to derive income from

their agroforests and forests in their way and style; and the principal primary benefit for government and its agencies is that they can meet preconditions for REDD investment; - all at low levels of financial, social and environmental costs.

Programmes concerning on forest carbon in Bungo District are now being designed, arranged and implemented based on regulation No. P.68/Menhut-II/2008 of the Forestry Minister about executing REDD funds allocation and No. P.30/Menhut-II/2009 about REDD in the context of climate change convention. In order to be part of national and international REDD fund allocations, institutions are required to command and provide a straightforward and reliable mechanism of enforcing comprehensive forest protection and fair distribution of benefits, and to be capable and empowered to monitor the performance of a REDD fund programme in Indonesia. The pioneer function of the Lubuk Beringin community and the *Hutan Desa* designation of the Lubuk Beringin forest lands may well be the starting points and signals for a multiplying process of REDD. It may also prove to be a key dynamic component of the self-funded NAMA commitment by Indonesia to the global community to stabilize national emissions at the 2005 level and to seek a shift to emissions from processes that make more tangible contributions to the national economy.

CONCLUSION

The presentation of the case study of the *Hutan Desa* designation of Lubuk Beringin is aimed at demonstrating a feasible way of containing and reducing transaction costs for the initial and subsequent phases of the processes of the REDD mechanisms. Where public policies suffer from inconsistencies and have not been able to avoid or reconcile conflicting and competing interests concerning present and future options of forest and forest land uses, the application of the principles and mechanisms of the a REDD scheme will offer opportunities to contain internal and external expenditures and costs. Especially in the initial phases, an international funding programme may face high transaction costs and thereby be unattractive to international investors. In a co-investment paradigm (van Noordwijk and Leimona 2010) the options of negotiated tenure, conditional on environmental service maintenance, on land that ultimately remains under state control, are an important category of rewards for environmental services, as well as a precondition for the use of other paradigms in payment for environmental services (PES).

The current level of control by forest authorities through development, approval and implementation of management plans to enhance environmental services may appear excessive for the area and in comparison to the lack of accountability by the state authorities where they have been in charge so far, but local sovereignty in managing the environment for local plus external benefits has to be earned in a stepwise fashion. Success of this conditional tenure paradigm in the international REDD context will require further trust-building and reciprocity in redressing the current inequalities and conflicts over Indonesia's forest resources. The *Hutan Desa* case in Lubuk Beringin territory features the importance of both bonding, horizontally integrating and bridging, vertically integrating the diverse forms and structures of social capital, moving between actors or players, while simultaneously addressing fairly and objectively the urgent issues of needs, claims, hopes and rights of the local people. As a balanced, comprehensive and dynamic construct, this programme will be effective in resolving existing conflicts and abuses, not as single measures. Reference to local wisdom and traditions has for good reasons throughout history characterised tropical rainforest utilisation and silviculture and mixed-crop agroforestry. The principle of mimicking natural forest structure and processes in protection and production agroforests and natural and planted forests makes as much good common and scientific sense today as centuries earlier. Now this theorem provides a solid base for a big step forward in developing fair and efficient REDD schemes.

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Attachment 5. Behavior and perception of environmental service providers on conservation agreements of rubber agroforests in Jambi (Sumatra), Indonesia. Ecology and Society (under review)

Grace B. Villamor and Meine van Noordwijk

ABSTRACT

Financial incentives can both support and undermine social norms compatible with environmental service enhancement. External co-investment e.g. through incentives from Reduce Emissions from Deforestation and Degradation (REDD) and eco-certification needs to synergize with local efforts by understanding local dynamics and conditions for free and prior informed consent. We assessed the perceptions and behavior of rubber agroforest farmers under existing conservation agreements as a step towards institutionalized reward schemes for agro-biodiversity using questionnaires and role playing games (RPG). To our knowledge, this is the first attempt to apply such a combination of methods to explore the perceptions of payments for environmental services. Results revealed a strong conservation belief system and social norms in the research site, with indications that individual interest in converting old rubber agroforest to oil palm, with consequent private gain and loss of local social agro-biodiversity benefits, is suppressed in the social context of a role playing game. In the game, all financial bids by external agents to secure an oil palm foothold in the village, were rejected despite indications of declining income in the village. Agents promoting an eco-certification scheme in the RPG had success and the responses obtained in the game would assist in the actual rollout of such scheme without creating unrealistic expectations of its financial benefits. Co-investment schemes that require higher level of trust and clarity of performance measures would have to address the potential discrepancy between individual preferences and community level planning and decisions, while recognizing that social norms color the responses of individuals when presented with alternatives.

Key words: conservation agreements, rewards for agro-biodiversity conservation,rubber agroforest, role playing game

INTRODUCTION

Market-based schemes to enhance environmental services in developing countries require monetizing biodiversity conservation, watershed protection, and carbon sequestration. Payment for environmental services (PES) schemes depend on funds derived from direct beneficiaries of such services, and/or an increased public interest to support conservation. These funds are used to offset legal opportunity costs of foregoing private benefits from activities with negative environmental effects (Peterson et al. 2010), and/or to provide additional income to land managers as a form of poverty alleviation strategy (especially for poor areas in developing countries). While most of the literature on PES focus on the design, possible arrangements, and the clarity on what ecosystem services is provided (Jack et al. 2008, Wunder 2008), few empirical studies so far describe the impact of PES on both land

managers and the ecosystem service targeted. Van Noordwijk and Leimona (2010) point out the need to assess the balance between the perceived fairness and efficiency of existing schemes. Gomez-Baggethun et al. (2010) noted the growing body of literature (Vatn and Bromley 1994, Martinez-Alier 2002, Soma 2006, Kosoy et al. 2007, van Noordwijk et al. 2007, Child 2009) that raises the question of how the utilitarian framing of ecological concerns and market strategies can modify the way humans perceive and relate to nature, which in the long-run may well prove to be counterproductive to the conservation aims. In behavioral economics, experimental use of market norms (in the form of monetary markets where monetary payments, motivation and effort are in a monotonic relationship) (Heyman and Ariely 2004) in situations that are governed by strong social norms has produced unexpected outcomes. Ariely (2008) discusses cases where financial payment offered in a situation that is operated by social norms (i.e. high level of reciprocity and trust, collective action and communal sharing) reduced motivation to engage, unless the payment was substantive. This situation is likely to happen in societies which solely depend on ecological life support systems, particularly in region of developing countries where market integration is only partial in many spheres. As argued by Leimona et al. (2009), modest financial gains from PES are only feasible for a subset of the rural poor in Asian uplands, given the number of potential beneficiaries. Per capita payments so far have been in small amounts, even compared to income levels of rural poor. Accordingly, putting or introducing market norms into the equation may chase away the social norms that govern the management of resources. Vatn (2005) suggests that rationalities and institutional structures have the capacity to modify behavioral patterns and motivation. By creating economic incentives for conservation, Gómez-Baggethun et al. (2010) are of the view that market-based mechanisms can induce the logic of individualism and competition in societies previously structured upon community and reciprocity values. International organizations promoting market mechanisms should therefore be aware of potential undesirable outcomes and be cautious not to create market norms in places where such logic is inexistent or culturally discouraged by existing institutional structures.

Role Playing Games (RPGs) have emerged as tools for communication between villagers and researchers, as they put stakeholders as players in close-to-real situations (Barreteau et al. 2003, Dare and Barreteau 2003). They enable the testing of scenarios (e.g. social networks, various ecological patterns) and used RPGs for training, observation and negotiation support, and as complements with the development and validation of multi-agent models (D' Aquino et al. 2003, Etienne 2003, Castella et al. 2005, Guyot and Honiden 2006). Gurung et al. (2006) in their companion modeling, RPG was applied in the context of watershed management and conflict resolution to initiate and facilitate dialogue between the villages and the research teams. In their study, scenarios were simulated through RPG. In the context of irrigated systems of Senegal River valley, Dare and Barreteau (2003) investigated the link between role play and reality in a negotiation process. They found that the social background of the players influenced the role-playing during the sessions. Their study suggested that to understand social relationships among players, a combination of other tools such as sociological interviews and analysis of videos, should be used utilized together. This paper tries to explore the degree of conservation awareness among villagers in conserving rubber agroforests and whether PES schemes in non-monetary form are sufficient to compensate non-conversion of agroforests into more profitable options. In a

context where strong social norms have so far maintained rubber agroforests as the primary livelihood strategy, our specific questions were:

1. How are current conservation agreements perceived at household level? Are household plans and ambitions aligned with village level planning and commitments? Are differences between household strategies apparent?
2. What are the responses to land-use options in a social setting with competing agents that promote conversion and conservation? Do these social responses match individual preferences?
3. How can a role playing game be used in the planning of further external co-investment in environmental services, e.g. through forms of eco-certification?

The context: conservation agreements

In Jambi Province, Indonesia, jungle rubber or rubber agroforest has been the dominant land use during the 20th century (Joshi et al. 2003). Studies show that rubber agroforest is an important agro-ecosystem type that supports biodiversity conservation (Williams et al. 2001). While rubber agroforest serves as a refuge for Red List and threatened species (Griffith 2000, Schroth et al. 2004, Rasnovi 2006, Beukema et al. 2007), it also provides ecosystem services such as soil conservation, protection of water quality, carbon sequestration, reduction of fire hazard and landscape beauty (Joshi et al. 2003, Suyanto et al. 2005).

In spite of positive ecological benefits of rubber agroforest, its latex productivity on an area basis is very low. Joshi et al. (2006) calculated the yield productivity of rubber agroforest which is 400 to 600kg of dry rubber per ha/year compared to rubber monoculture which is 1000 to 1800kg per ha/yr. However, farmers benefit from other resources of the rubber agroforest such as food, fruit (e.g. durian, mangosteen, coffee, etc), fodder, fuel wood and timber (Gouyon et al. 1993, Michon 2005).

In the last decade of the 20th century, the combination of improved road access, an inflow of migrants and emerging oil palm industry put pressure on the remaining forest (Fig. 1) (Ekadinata et al. 2010). As documented in detail by Miyamoto (2006a, 2006b, 2007), the increase in land-use intensity may have actually anticipated the increased availability of labor that would make large rubber areas profitable through share-tapping arrangements. The transition from rubber agroforest (with a time-averaged above-ground carbon stock of around 80 Mg ha^{-1}, depending on the management regime) to continuous/permanent cropping such as monoculture oil palm or rubber (both with a time-averaged above-ground carbon stock of about 40 Mg ha^{-1}) led to increase carbon emissions (van Noordwijk et al. 2008; Murdiyarso et al. 2002).

Efforts to retain existing rubber agroforests are relevant for the on-going implementation of REDD strategies in Jambi Province (Akiefnawati et al. 2010). The potential public value of maintaining rubber agroforest for its biodiversity is probably more relevant than the impacts on carbon emissions for it coincides with local value as the agroforest area around a village is still seen as a 'club good' (Paavola and Adger 2005) with access to most non-rubber products for all community members. The development of a reward scheme for biodiversity conservation was supported through action research under the Rewarding Upland Poor for Environmental Services (RUPES) Phase 1 project operated since 2002 by the World

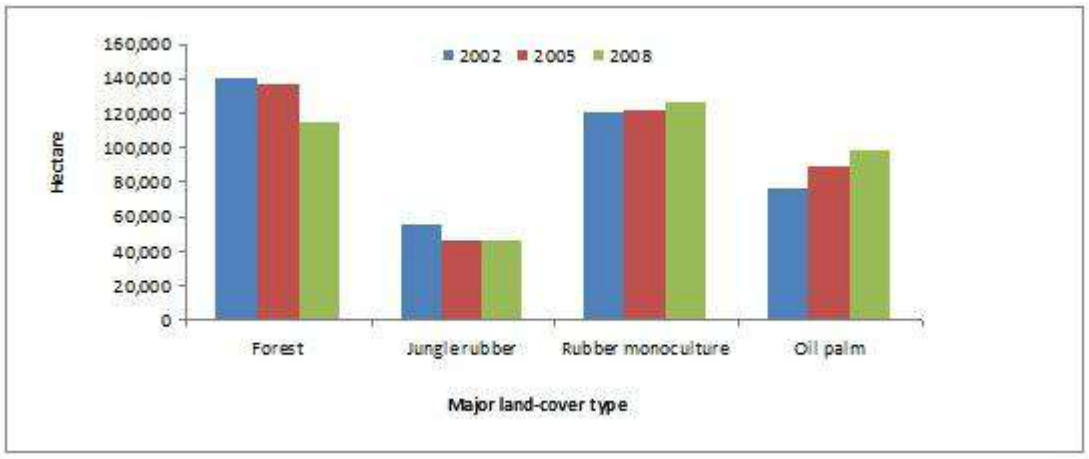

Fig. 1. Land-cover change between 2002 and 2008 in Jambi Province (Source: Ekadinata et al. 2010)

Agroforestry Centre (ICRAF). The target of the action research was to identify the ecosystem services, explore how they could be measured, to whom rewards should go, who might be willing to pay for rewards, how and in what form funds could be collected, and what amount or form would be appropriate. To obtain answers to these questions, the action research follows a conceptual framework considered appropriate for developing pro-poor PES schemes shown in Fig. 2.

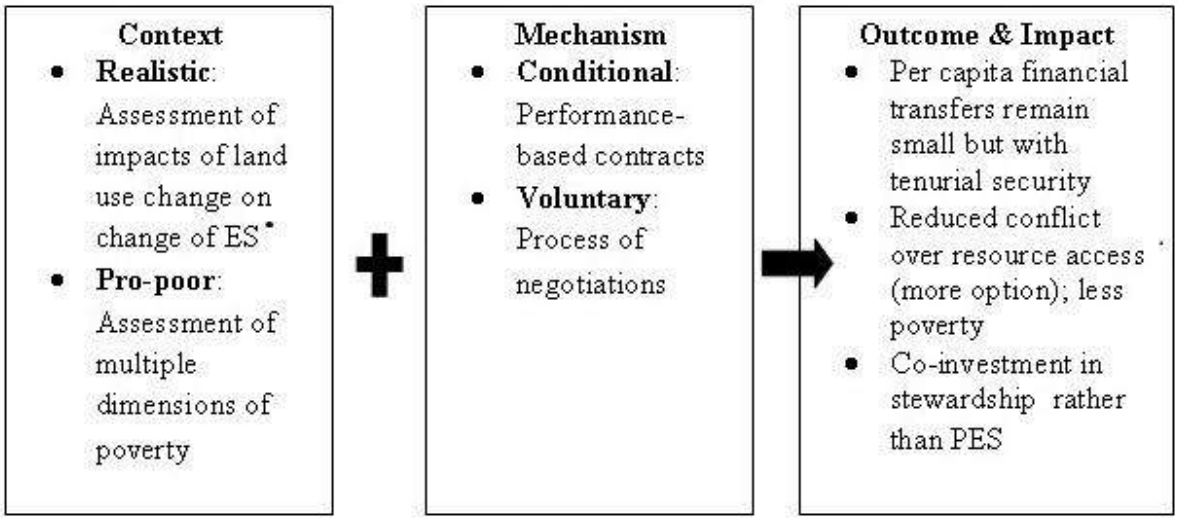

Fig. 2. Conceptual framework for establishing pro-poor rewards scheme for agro-biodiversity conservation

One of the early outputs of this project was the establishment of conservation agreements as an initial step in the institutionalization of reward schemes for agro-biodiversity. Four conservation agreements (CAs) on agro-biodiversity conservation (the result of a long process of discussion and exploration with local villagers in the area) appropriate for rubber agroforests were created and signed in 2007 by the villagers (Table 1). It should be noted that none of these schemes provided direct monetary payments to the villagers.

Together with the agreements, support funding was provided by the RUPES Program to the communities as a part of the RUPES goals to preserve the biodiversity-rich rubber agroforests combined with the economic needs. Through the village heads with the assistance of a local NGO (i.e. WARSI), the communities received and managed the support funds. The agreements included the farmers' rubber agroforest practices, management plan and monitoring activities.

Based on the communities' performance, it is hoped the villages will negotiate and build their case for rubber latex eco-certification (or eco-labeling) and REDD schemes. These market-based incentive schemes are perceive to be the only way to save the remnants of forests and rubber agroforests from being converted to rubber monoculture and oil palm plantations (Feintrenie and Levang 2009).

Table 1. Conservation agreement schemes for rubber agroforest conservation

Schemes	Ecosystem services type*	Target benefits for the community
(1) Provision of high yielding grafted (clonal) rubber seedlings	- provisioning services	To increase the latex yield production of jungle rubber by mixing with grafted (clonal) planting material
(2) Establishment or revival of communal jungle rubber areas (with specific work plans)[α]	- supporting services - regulating services	To conserve the agro-biodiversity in the area through maintaining jungle rubber areas; and To use as a pilot test for village forest rights
(3) Installation of micro-hydro power plants along the river	- provisioning services	To provide electricity to the villagers and to regulate and maintain the river flows
(4) Establishment of mini-reservoirs in the riversides	- provisioning services	To maintain fish stocks for food consumption

± Following the basic categories from Millennium Ecosystem Assessment
ǂ For information about tenure security of rubber plots see Suyanto et al. (2005)

METHODOLOGY

Site description

The study site is located in Bungo district, Jambi province, (Sumatra) Indonesia (see Fig 3). Within the district, three adjacent villages under the Bathin III Ulu sub-district were selected, namely: Lubuk Beringin, Laman Panjang, and Desa Buat. The villages are near the foothills of Kerinci Seblat National Park. Except for Desa Buat, these villages are considered poor and have poor access to market roads and electricity infrastructures due to their distance from the district centre (i.e. 2- hour drive by motorbike). The population status of the three main villages is presented in Table 2. Their main source of food is rice; and the main source of income is rubber (*Hevea brasiliensis*) and occasionally durian and other local fruit and medicinal plants obtained from the rubber agroforests.

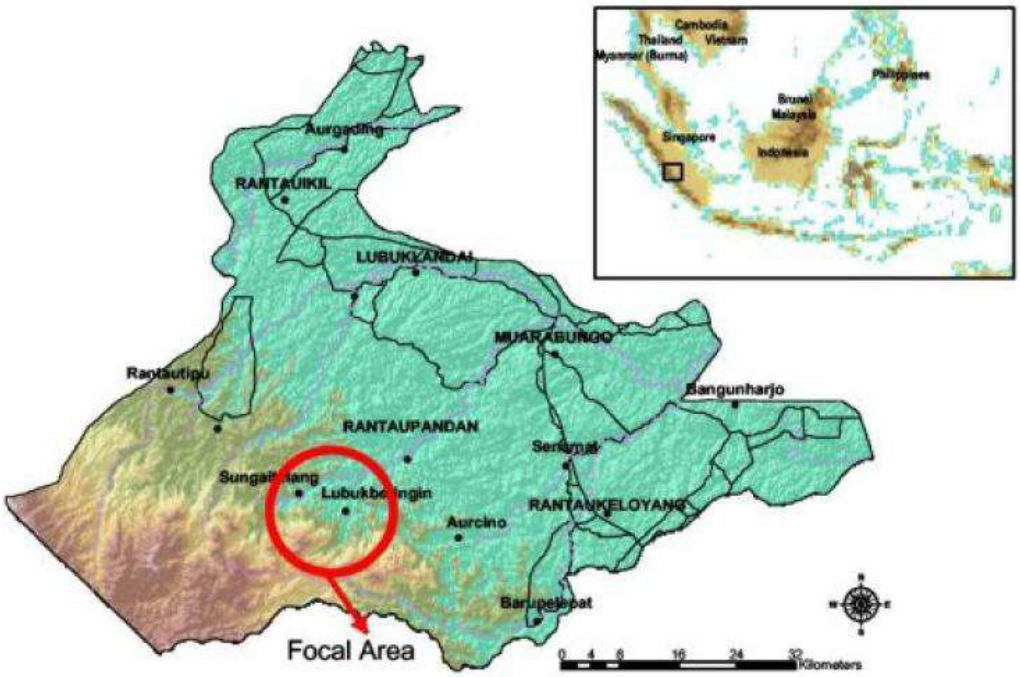

Fig. 3. Map of the study site (Bungo district), Jambi Province, Indonesia

Table 2. Population and number of households in the study site (2003, Statistics of Rantau Pandan)

Village	Population			No. of persons per km^2	Population density	No. of households	Average number of persons per household
	Male	Female	Total				
a. Lubuk Beringin	184	212	396	27.22	14.55	102	4.02
b. Laman Panjang	366	365	731	41.17	17.76	182	4.04
c. Buat	566	514	1,080	93.28	11.58	267	4.25
Total	**1,116**	**1,091**	**2,207**			**551**	

(Source: 2003 Statistic of Rantau Pandan Sub-District)

The majority of the population belongs to two ethnic groups namely, Jambi and Minang. They follow the traditional practice of a joint-family or lineage ownership of land wherein a matrilineal inheritance system is applied to paddy fields and a patrilineal inheritance system to rubber fields (Suyanto et al. 2005). Each village has appointed village heads and community rules (i.e. PERDUS) in managing their village forests (Akiefnawati et al. 2010). The people in these villages have strong ties with each other and respect very much their village elders.

Survey questionnaire

A survey was conducted to explore local farmers' perspective of the conservation agreements. A total of 100 household respondents (93 males and 7 female heads of the household) were randomly selected from the three villages (Figure 4). Under the RUPES programme, Desa Buat and Laman Panjang Besar are non-participating villages in

conservation agreements. Each selected respondent was interviewed on the following facets: 1) awareness of the conservation agreements; 2) motivation to participate and continue; 3) perspective on the agreements regarding their potential to conserve the biodiversity in the area; and 4) future land-use preferences. A descriptive statistical analysis was used to analyze the data (Table 4). Interviews were mostly conducted with household heads since they are heavily involved in and well knowledgeable on rubber farming. Secondary information was collected and reviewed while key informant interviews (i.e., with RUPES researchers, village heads and store vendors who were mostly women) were also conducted for triangulation.

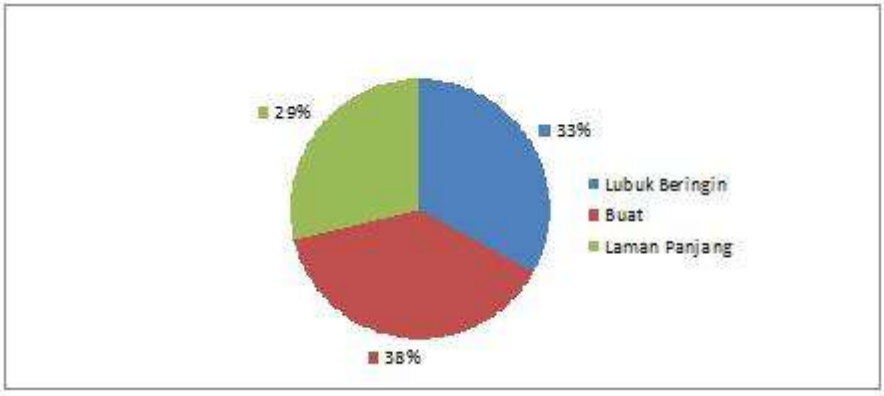

Fig. 4. Village representativeness of respondents (%)

Role playing game

The RUPES role playing game (designed for the inauguration of RUPES training course in Chiang Mai in 2003 and used, inter alia, at the 2006 international RUPES Conference in Lombok). The RPG was modified for this research and used to introduce the idea of eco-certification of rubber latex from rubber agroforest as a reward scheme. The rules and settings of this RUPES game were originally based on the village of Lubuk Beringin rubber agroforest landscape. Below are detailed materials, agents and their role descriptions, and game settings and session.

Game board

Three land-use game boards with 5 x 5 grids marked with different land-cover types were prepared (Fig. 5). Each sub-watershed (or game board) has 1 village (V), 1 unit of paddy field (R), 9 units of rubber agroforest plots (RAF) and 14 units of forest (F).

Agents and their role descriptions

There are six types of players, each with the following roles and descriptions:

1. Villagers – from each village 7 farmers were selected. These farmers were the ones interviewed in the survey. Though, not all of the respondents were able to join, the composition of each group was representative of each village. The villagers' target is to maintain a minimum of 1 Rupiah per year for each person living in the village to sustain themselves. To increase their standard of living, they have to raise additional income;

2. Buyer 1 - a logging company agent for pulp wood and paper who wants to make a deal with the villagers to convert natural to logged forest and is offering an attractive price. The buyer's target is to convert all the units of the forest to logging areas;

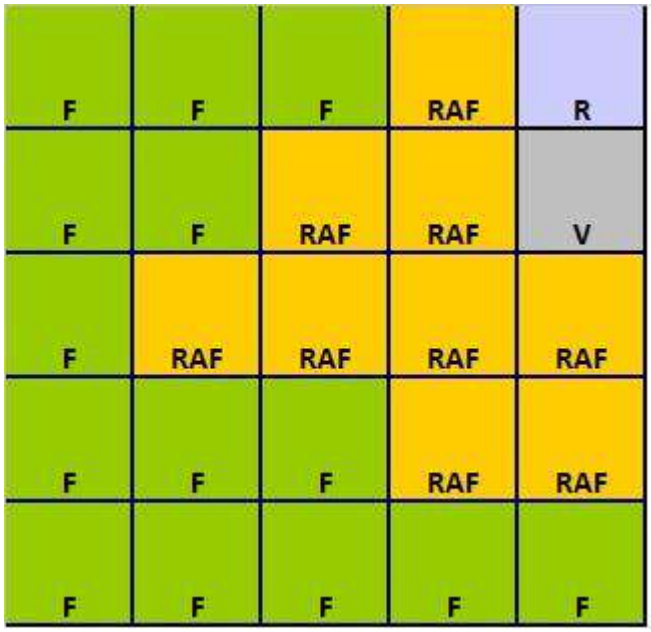

Fig. 5. Land-use game board with units of forest (F) and rubber agroforest (RAF), a unit of paddy field (R), and village settlement (V)

3. Buyer 2 - an oil palm company agent who promises to convert any type of land to oil palm which gives a negotiable net benefit on the third year after conversion. The buyer's target is to convert at least 40 units of land in the catchment, otherwise the company will bankrupt;

4. A 'Save the Tiger' agent who offers negotiable rewards to villages who still have at least 10 plots of continuous forest cover. A minimum of 40 units of intact forest must be maintained at all times within the watershed to prevent local extinction. Once the village meets the NGO's target, a certificate of conservation effort (i.e. sticker) will be awarded;

5. A watershed protection board officer who offers some rewards for intact forest. The officer's target was that all villages in the valley make a clear commitment to protect the water resource. Once the village meets the board's target, a certificate of conservation effort will be awarded; and

6. Buyer 3 - A 'green rubber' company representative looking for sustainable rubber production. The company's goal is to support the village with rubber agroforest farms where they have a watershed protection program and also supports the tiger conservation. Once the village meets the board's target, a certificate of conservation effort will be awarded.

Settings

In the game board, each land unit provides the following income (rupiah) per year: paddy fields = 10 rupiah per year; rubber agroforest = 4 rupiah per year; forest = 1 rupiah per year; logged forest = negotiable payment (0 rupiah per year thereafter); village = 15 rupiah per year; oil plantation = 8 rupiah per year (after an initial 3 year period); and sustainable green rubber = 2 rupiah per plot per year. Due to the physical constraints of their land, the villagers could not expand their paddy fields and village area. The population at year zero is 75. A score sheet is provided to track the scores on how targets are met, and to monitor the

financial conditions (Table 3). Play money was used for the buyers (i.e. Oil palm company, logging concession company, watershed protection board, 'Save the Tiger' NGO, and green rubber company) while stickers were used to recognize the village conservation efforts.

Table 3. Sample score sheet for each village group

Land-use type	Income per year	Number of plots/ units						Income					
		Y0	Y1	Y2	Y3	Y4	Y5	Y0	Y1	Y2	Y3	Y4	Y5
Forest	1	14	14	14	14	11	11	14	14	14	14	11	11
Logged Forest	0	0	0	0	0	0	0	0	0	0	0	0	0
Agroforest	4	9	9	9	9	9	9	36	24	20	20	20	10
Ricefield	10	1	1	1	1	1	1	10	10	10	10	10	10
Village	15	1	1	1	1	1	1	15	15	15	15	15	15
Total		25	25	25	25	22	22	75	83	67	65	62	55
Required								75	75	75	90	90	90
Money stickers to meet basic needs								0					
Stickers									7	8	6	-	10

Game session

At first, the farmers were asked to voluntarily select the roles they wanted to play. After selecting their roles, instructions were provided on how to play the game. The group of buyers was placed separately from the villagers. In every time step or round, the buyers visited the villages and negotiated for their respective targets. Each round of negotiation was about 15 minutes. The game master announced when the time was over and the buyers would go to their respective places to check their targets. At the same time, the villagers would calculate their income for the given year using the score sheet. Different scenarios or stressors were imposed during the game to see the players' reaction in meeting their targets. At round 3, a transmigration program was enforced where the population increased by 20%. In year 4, 3 units of forests were burned down due to natural forest fire, and at year 5, the rubber price was decreased by half. A total of 6 rounds were played and afterwards reflections were asked from the farmers. The whole game was facilitated by a game master who oversaw and checked all the rules were in place and 4 assistants to assist the players and record the interactions.

RESULTS

The descriptive statistics of the key socio-economic variables and conservation agreement perceptions from the survey is summarized in Table 4 and 5. The analysis shows that the majority of the respondents are rubber-based farmers with 52% of their income from rubber–latex production with an average landholding of 7 ha. The villagers' ages range from 23 to 75 years old.

Table 4. Descriptive statistics of the respondents in the study site for 2010

Variables	Mean	Std. deviation	X_{min}	X_{max}
Age	45.0	±12.6	23	75
Ethnicity	2.6	±0.9	1	4
Household size	4.7	±1.6	2	9
Education level	1.1	±0.62	0	2
Labor availability	3.4	±1.6	1.6	8
Land holdings (ha)	7.0	±14.6	1	142
Gross annual income ($)*	4,907	±696.2	120	45,428
Gross annual income per capita ($)*	1,176	±2006.1	30	11,918
% income from rubber latex	52.2	±42.9	0	100
% income from rice production	13.3	±25.2	0	100
% income from non-timber forest products	4	±1.3	0	100
% income from other sources	20.5	±3.4	0	100

Note: * 1US$ = 9,000.00 rupiah (at the time of writing)

Table 5. Descriptive statistics of the respondents on conservation agreements for 2010

Key Variables	N	Range	Mean	Std. Deviation	Frequency/ # of individuals
I. Participation to CA	100	2	1.2	±0.46	-
a) No answer					3
b) Yes					75
c) No					22
II. Type of CA schemes joined	100	4	2.3	±0.18	-
a) Clonal material					45
b) Communal jungle rubber					45
c) Mini-hydro					55
d) Fish conservation					34
III. Willingness to continue or participate	100	2	1.10	±0.62	-
a) No answer					15
b) Yes					60
c) No					25
IV. Conservation agreement is enough to maintain the rubber agroforests	100	2	1.04	±0.60	-
a) No answer					15
b) Yes					66
c) No					19
V. Preferred land use for financial reason	100	5	1.62	±1.15	-
a) No answer					13
b) Rubber agroforest					44
c) Monoculture rubber					18
d) Oil palm plantation					20
e) Others (e.g. rice)					5
VI. Preferred land use for agro-biodiversity conservation	100	6	1.33	±1.10	-
a) No answer					15
b) Rubber agroforest					56
c) Forest					5
d) Fallow areas					10
e) Others					10
f) Not sure					4

Participation and motivation

Of the 100 household respondents interviewed, 75% participated in conservation agreements (Table 5). The most preferred scheme is the mini-hydro power plants which generate electricity for the village members during night time (Fig. 6). This is one of the main motivations for which villagers continue with the conservation agreement. The villagers, especially in Lubuk Beringin, viewed the mini hydro-power plant as a way to

protect the river, the forest and the rubber agroforest (personal communication with the Lubuk Beringin village head). The majority of the respondents availed a combination of two to four schemes, e.g. a combination of grafted (clonal) rubber seedlings, mini hydro-power and communal rubber agroforest farms. For example, in Lubuk Beringin, two hectares of communal rubber agroforests farms were established and two mini hydro-power plants were installed. In Sungai Letung (a sub-village of Buat), three hectares of communal rubber agroforests farms were established. In Sangi (a sub-village of Buat), grafted (clonal) rubber seedlings were provided to plant alongside the old rubber trees. Three rubber farmer groups and nurseries were established and two micro-hydro power plants were installed in Laman Panjang.

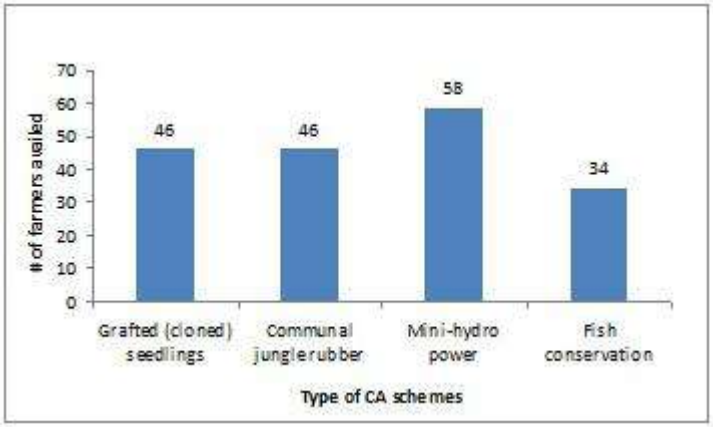

Fig. 6. Preferred conservation agreements (CAs) schemes, 2010 in Jambi Province

About 25% of the respondents were not involved in pre-existing conservation agreements either because they had not been informed about the RUPES project (and previous ICRAF project) or they were not part of the RUPES project assistance due to their distance from the target villages. From these respondents, we could compare the perceptions on their future land-use preferences with the respondents involved in conservation agreements. Around 60 of the respondents signified to continue with the contract and 15 wanted to discontinue (Table 5). The reason for non-continuation is due to the poor performance of grafted (clonal) rubber seedlings (e.g. many of the grafted seedlings did not survive), the fear of limiting lands for crop expansion, and low confidence in their village heads.

Potential of conservation agreement schemes to conserve biodiversity

The main reason the conservation agreement schemes have been developed in Jambi, is to preserve the remaining rubber agroforest because of the substantial ecosystem services it provides. The survey results revealed that 66% of the respondents agreed while 19% disagreed and 15% have no preference.

Preferred land use

If provided with additional financial investments (e.g. establishment of credit facilities), 43% of the respondents preferred to remain engaged in rubber agroforests, 18% preferred monoculture rubber, and 20% expressed interest in oil palm plantation. Further reasons for their land-use choices were explored and listed in Table 6. For conservation of agro-biodiversity, the rubber agroforest is still the top land-use choice (Fig. 7).

Table 6. Reasons for the land-use choice of the respondents in the study site, 2010

Jungle rubber/rubber-mixed agroforest	Oil Palm Plantation	Intensive rubber cultivation
• Easy to manage	• Short farming period	• Higher yield production
• Well-established farming experience	• Highly-priced commodity	• Short tree spacing (thus higher tree density per farm plot)
• Produce various crops (e.g. fruits and medicinal plants) at the same time		
• Less labor requirement		
• Higher resistance against pest and diseases		

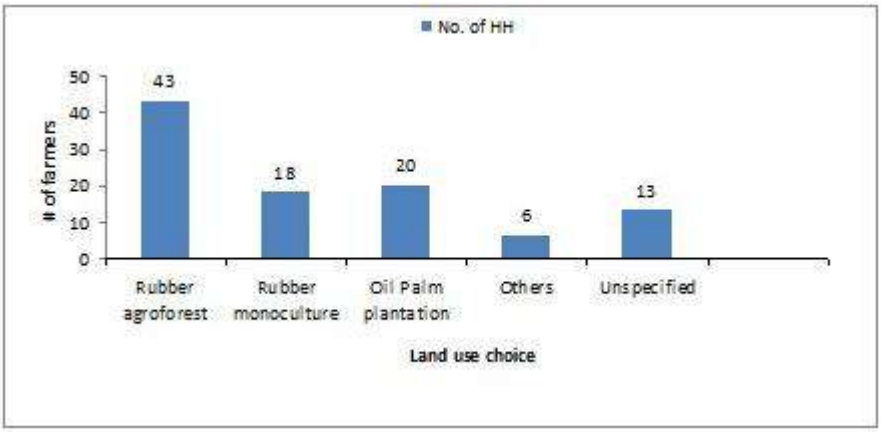

Fig. 7. Preferred land use to support agro-biodiversity conservation, 2010 in Jambi Province

Social behavior in RPG

The RPG showed what would be the possible reactions of the villagers if buyers were interested in converting their rubber agroforests or maintaining them through PES schemes. First of all, they designed their simulated landscape (or game boards) according to the actual village land-use configuration. They based the arrangement according to the land use that is immediately adjacent to their villages. For example, the village (i.e. settlement area) should be immediately connected to the paddy field and the paddy field should be surrounded by rubber agroforest.

The game lasted for more than three hours with six rounds or time steps (i.e. each time step is equal to one year). Throughout the whole game, the land-cover types and its arrangement did not change. Scenarios or stressors (i.e. population increase, forest fire, and rubber price fall) were simulated to see if they would be interested to sell their units of forests and agroforests for more profitable ventures (e.g. oil palm plantation and logging concession). None of the villagers took the attractive offers.

The performance of the villages was assessed based on the results of their yearly income (Table 7). The required income should match up with the village population needs, which is to maintain a minimum of 1 Rupiah per year for each person living in the village. However, if they want to increase their standard of living they have to raise additional income. During year 0 and year 1, three villages were able to meet the required target of 75; Laman Panjang even exceeded its target at year 1. Then, at year 2, Lubuk Beringin performed very well while Desa Buat met the target and Laman Panjang was 8 points short. When population increase, forest fire, and rubber price fall were imposed at year 3, 4 and 5 respectively, their incomes plummeted in spite of the attractive financial offers from oil palm and logging companies. At year 4, only Lubuk Beringin was able to meet the target income but hardly recovered after another year. This suggests that villagers preferred to maintain the original land cover and were satisfied with the minimal incentives provided by the watershed protection board and the Save the Tiger NGO.

Table 7. Summary of the score sheets representing the yearly income of the villages against the target

	Income					
Villages	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Required/Target income	***75***	***75***	***75***	***90***	***90***	***90***
Lubuk Beringin	75	75	85	85	90	58
Desa Buat	75	75	75	75	51	82
Laman Panjang	75	83	67	65	62	55

DISCUSSION

Perceptions of current conservation agreements

Though none of the schemes from conservation agreements were providing direct monetary payments at the time of the survey, the conservation agreements set the stage for potential ways of pursuing eco-certification as well as REDD schemes. Eco-certification or labeling of rubber latex from rubber agroforest and the REDD scheme are ways to bring more income to rubber agroforest farmers for the agro-biodiversity services they provide. The combination of RPG and survey results revealed a strong support from village farmers to conserve rubber agroforests. Rewards for conservation of agro-biodiversity are not always in monetary form. The example from the Jambi case showed that rewards could be of direct importance to the villagers' needs such as electricity and access rights (i.e. communal rubber agroforest farms). Since the area is far from the district centre, access to public services such as electricity is lacking. Hence, the establishment of mini-hydro power plants (even indirectly to conserve the rubber agroforests) was seen as a success and motivated the villagers to continue the conservation agreements. As the rubber agroforests of the villages border on and are partly classified as watershed protection forest, the key issues for the villages were their lack of tenure security and authority to deal with external disturbance to the forest upstream. Van Noordwijk et al. (2008) found that planting trees brought communal land under private control, and a small number of tappable rubber trees per ha was enough to establish a claim. The emphasis was thus on extensive rubber

gardens, where the local rules in many villages follow the 'fallow rotation reserves' (locally called *sesap-nenek* or 'ancestors bush'). Thus, the RUPES programme provided technical assistance on establishing communal rubber agroforest farms in harmony with the villages' local custom and the community-based forest management (Akiefnawati et al. 2010).
On the other hand, the poor performance of grafted clonal rubber seedlings was seen to be the only unsuccessful scheme for some farmers, but this was negligible compared to the success of bringing electricity to the remote areas through the mini-hydro plants. Farmers who were under this scheme complained that the planting material did not survive or did not produce the expected yield. We did not ask further about the probable causes for non-survival of those clones. Before the implementation of conservation agreements, most of the farmers in the area were strongly considering to switch to monoculture systems if investments were to be provided (Bennett 2009, Leimona and Joshi 2010). This matches up with the results shown in Table 4. If provided with financial credits for upfront investment, there is a good chance that some of these farmers will shift to monocultures. Interestingly, the farmers' interest in oil palm and rubber monoculture did not emerge during the RPG.

Social behavior in RPG versus reality

Regarding social behavior of farmers/villagers towards the buyers and agents, the following were observed: The villagers were very reluctant to negotiate with oil palm and logging companies in spite of the attractive profits. This might be due to their strong belief system in conservation which could be attributed to their long history with various conservation and research organizations. For example, the RUPES project has been in the area since 2002 while the Integrated Conservation and Development Project (ICDP) started in 1998 (Akiefnawati et al. 2010). Accordingly, during the ICDP days, Lubuk Beringin was already involved in an agreement which includes maintaining forest areas, non-opening of lands with more than 30 degrees slope and planting bamboos along river side. Hence, some of these farmers must have shared their conservation vision during the game. The game was conducted in the presence of two researchers who were also involved in the RUPES project in the area, but we are unsure whether this influenced the behavior of the players. This tool was implemented for the very first time in the study site. The survey and interviews as suggested by some studies (Dare and Barreteau, 2003) helped to verify and check farmers' behavior during the game.

Synergy between the two economic agents i.e. oil palm and logging concession companies together with stressors did not help to convince the farmers to take their offers, suggesting strong non-economic motivations of the villagers. In reality, most of the rubber agroforest farmers who would like to engage in oil palm or monoculture rubber are financially and labor constrained. They mostly depend on their family labor. Table 3 shows the mean available labor and landholdings per household, which is not enough for labor intensive farming practices such as oil palm or rubber monoculture plantation. Those who dominate negotiation in the villages (e.g. village elders) have the final say on how to use land. Though on some occasions, other members were already interested in engaging with oil palm and logging companies, the final decision came from the eldest member of the group particularly the one with a community leadership position. In reality, most of the villagers belong to the Jambi ethnic group which has strong respect for community elders. Young members of the village give high regard to the village elders and heads due to their strong adherence to patrilineal and matrilineal traditions. The villagers found the game very

interesting and it helped them to see their villages when facing economic difficulties (i.e., right after the round when stressors were imposed). They found the game easy since the rules and settings were created based on their actual village conditions. Also, they were able to communicate with each other and their neighboring villages. This helps simulate a natural or realistic social environment.

Testing potential response to new ecosystem service co-investment schemes
Despite the lower profits offered, the watershed protection board, Save the Tiger NGO and Green Rubber Company were the most successful agents in the game. The number of certificates awarded by these agents to the villagers for maintaining units of forest and agroforests were seen as recognition. Heyman and Ariely (2004) perceived a social market condition when there is no monetary reward. This might reflect an example of social norms operating within the villagers.

The concept of PES on eco-certification and REDD was implicitly introduced using the concept of 'sustainable green rubber' in which rewards can only be received if the conditions such as complying to the rules of the watershed protection board and Saving the Tiger program were met. In reality, the recent REDD+ policy and proposed eco-certification schemes set conditions and criteria on forest protection and biodiversity conservation. The concept of *hutan desa* or village forest in Indonesia was first implemented in Lubuk Beringin where a 2,300 ha of forests was set aside for a proposed REDD scheme (Akiefnawati et al 2010).

Conservation agreements as initial pilot tests on how to pursue larger reward schemes (e.g. eco-certification and REDD) could provide credible recommendations on the type of arrangements and reward scheme designs t be established. The development of conservation agreement uses the bottom up approach and could also be used as a tool to assess whether the involved community has strong social or market norms.

CONCLUSION
The results of the survey and RPG in this study suggest that the villagers have a strong conservation belief system which operates by social norms. Thus, setting up a market-based scheme such as PES (which may introduce market norms) should be done carefully by understanding the local dynamics and conditions for free and prior informed consent. Van Noordwijk and Leimona (2010) described a 'co-investment scheme' as a reward paradigm that considers trusts and a higher level of conditionality, which includes mutual accountability and commitment to sustainable development. In this scheme, the conditionality is measured when the buyers have full trust that the management plan (including local monitoring) set up by community will enhance the provision of ecosystem services. Hence, land-use conflicts and their possible collateral damage to ecosystem services are reduced or avoided. Also, this scheme retains the reference to social exchange rather than financial transaction. In the case of Jambi, it is deemed to be the appropriate scheme for the type of ecosystem service providers.

The RPG as an experimental tool to explore social behavior in the context of rewards or payments for ecosystem services has proven to be effective in introducing PES concepts but, at the same time, doesn't give huge expectations to the farmers. Whether the community is

governed by social or market norms, complementing RPG with survey questionnaires and interviews is crucial to reveal the perceptions and behavior of the players.

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Attachment 6. Diversity deficits in modelled landscape mosaics. Ecological Informatics doi:10.1016/j.ecoinf.2010.08.003

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Diversity deficits in modelled landscape mosaics

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ABSTRACT

We outline several diversity factors that modellers and models can include directly or indirectly in order to improve the accuracy and usefulness of the model. Without considering these factors, different types of diversity deficit can arise. These deficits can be considered in three domains: 1) in the real world where actual diversity is less than a potential state that is deemed desirable (hence we worry about loss of biodiversity and cultural diversity); 2) in modelling of the real world (where 'residual variance' may represent a diversity deficit of the model); and 3) in our recognition of the driving forces that are used to construct a model (a diversity deficit due to oversimplification). The goal of this review is to use these three domains of diversity deficit to evaluate existing models, with a longer term goal of creating a more robust framework for assessing landscape models in the future. To that end, we evaluate the behaviour characteristics and routines of agents in some current models. We also address one of the fundamental challenges to modelling diversity, which is the integration of non-economic motivations in the decision making of human agents.

Attachment 7. Feedback loops added to four conceptual models linking land change with driving forces and actors. Ecology and Society 16(1): r1

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While we appreciate the efforts to develop a functional taxonomy of models of land use change, driving forces and actors, we miss an important class: models with feedback from the consequences of land use change to actors, to driving forces and/or both. As the primary societal reason for a scientific analysis of changes in land cover is the consequences of land cover change on a wide range of stakeholder interests and the various ways stakeholders can try to modify land cover change in their favour, the utility of the conceptual models will depend strongly on the type of entry points the models provide for feedback (Fig. 1).

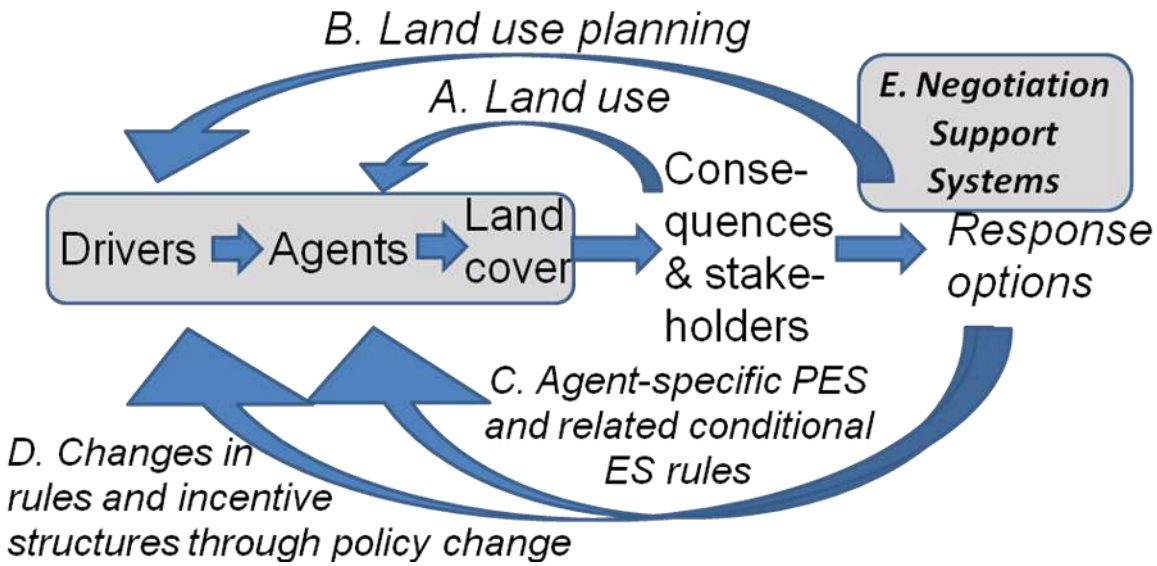

Figure 1. Drivers, Agents and Land cover as subset of a multi-stakeholder, multi-functional, multi-institutional perspective that involves multiple feedback loops

Four main types of 'feedback' are:

A. Land use, or the direct benefits that agents derive from their impact on land cover; it usually involves direct learning and relatively short response cycles, although there is ongoing

debate about how much an economic lens misses of real motivations of the agents(Villamor et al., 2010).

B. Land use planning, or the attempts by stakeholders of land cover beyond the land user, to change the rules that are part of the set of drivers influencing land users.
C. Agent-specific modification of incentive structures that are conditional on performance, as attempted in forms of Payments for Ecosystem Services and related institutions (Tomich et al. 2004, Van Noordwijk et al. 2004, Swallow et al. 2009, Van Noordwijk and Leimona 2010).
D. Generic changes in rules and economic incentives through policy change that is expected to enhance ecosystem services and/or economic performance at (sub)national scale, as currently discussed under the REDD umbrella where clarity on drivers and agents is needed (Blom, et al, 2010).

A fifth component of the system (E) is at the interface of A...D in the form of Negotiation Support Systems (Van Noordwijk et al., 2001, Clark et al., 2010), where multiple stakeholders, usually based on their own understanding and interpretation of the Drivers-Agents-Change relationship, negotiate a range of options to manage the tradeoffs between their respective stakes.

Regarding the claim of Hersperger et al. that most current agent-based models consider only one type of agent, that may be true numerically, but the exceptions are important and point to a way forward. Typically, agent-based models capture the 'heterogeneity' of a group that would be considered to be homogenous or represented by an average in other models. Brown and Robinson (2006) referred to heterogeneity in 2 types, namely 1) "variability" - which reflects continuous variation in agent characteristics across entire population or within single agent types - and 2) "categorization" - introducing multiple types or groups of individuals with similar or differentiated preferences. Accordingly, heterogeneity is represented through various agent characteristics e.g. preferences on a number of different factors that are independent and uncorrelated, thus creating complex interactions. This method of categorization was applied in the VN-LUDAS model (a multi-agent system model applied in Vietnam) of Le et al 2005 and in follow-up models that are currently in development. In fact agent-based models can also apply to the 'drivers' rather than to the actors, as is done in organization centered multi agent systems (Purnomo and Guizol, 2006).

Current modelling efforts that take the driver-agent-land relationship as a subsystem of a dynamic feedback description (van Noordwijk 2001, Lusiana et al. 2010, Villamor et al., 2010) are challenged at the way models can be validated (Lusiana et al., 2011), but important aspects that emerge from these efforts are that the degree to which models can be learning tools for multiple stakeholders and act as 'boundary objects' (Clark et al., 2010) is at least as important as their academic 'validation' as conventionally quantified.

The Hersperger et al. taxonomy does not really address the nature of multiple scale issues in overall system dynamics. Further work on the framework is needed before such categorization of models can help "individual research projects, communication and generalizations beyond the individual project", as the paper claims.

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Attachment 8. REDD+ Actor Analysis and Political Mapping: An Indonesian Case Study

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Abstract

Forests are not empty. There are various rights and interest in forests as well as the people who live in and around forests. If the Reducing Emissions from Deforestation and Degradation plus (REDD+) mechanism is to work unilaterally by state and overlook the role of various actors, then it is likely that REDD+ will fail. From our stakeholder analysis and political mapping in Jambi, a priority province for REDD+ implementation in Indonesia, we show that REDD+ actors with knowledge, power and leadership, can support or reject REDD+. Specifically, we discuss the implementation capacity and new directions in policy. The analysis also provides indications as to the readiness of Jambi to implement REDD+, who wins and loses in adopting REDD+ and intervention scenarios to make REDD+ work. The methods used in this study are general and could be implemented elsewhere in Indonesia or abroad.

Keywords: REDD+, actor, governance, institution- and-political-mapping, Jambi

INTRODUCTION

All actors (counted stakeholder), including the government at various levels, are aware of the negative effects of deforestation and forest degradation. The effort of reducing deforestation and forest degradation is gaining momentum with global efforts working to combat climate change. About 17% of climate change is attributed to deforestation and degradation. Reducing Emissions from Deforestation and Degradation plus (REDD+) is an effort to combat deforestation and forest degradation through carbon funding and market schemes. Stern (2007) and Chomitz (2007) found that reducing emission from deforestation is much more economical than establishing new forests to absorb CO_2.These have been discussed in the global arena e.g. COP 13, 14, 15 and 16. REDD+ aims to reduce emissions through reducing deforestation, improving forest management, conservation and increasing carbon stock. REDD+ has become a common debate in local and international policy arenas. Annex 1 provides list of abbreviation used in this article.

Policy studies frequently, wrongly, assume that all actors have a common goal, but a lack of knowledge is not the only problem. Scientists often simply feed knowledge to the actors. In reality, each actor behaves according to their real goal and on limited information and capacity. To complicate the situation even further, actors interact with other actors, influencing and depending on each other.

Actors do not generally behave aimlessly. They are logically consistent and bound to their own view of the world (Purnomo *et al.* 2005). . They are guided not only by the idea of maximizing their income but also by other values Actors prefer policies that are secure and increase returns on their assets. They tend to aggregate into groups to be able to influence policy within existing institutions (lobbies, parties and government) or against existing institutions. We need to discover how organized interests work to achieve goals, what government policies are adopted and how and when actors decide to reject, reform, or build political institutions (Frieden, 2000).

While REDD+ is a 'hot' topic worldwide, the various rights and interests of forest stakeholders is seldom understood and taken into account. Assuming that the state has 100% control over forests is neither correct nor useful. Forest areas are not empty: local people have been living in and around forests for hundreds of years; forest concessionaires have been allocated rights to harvest timber; plantation companies have the legal right to convert a part of forests to agricultural land; mining companies are interested in making a profit from coal deposits; politicians need to satisfy those who elect them; and high-level government officials in power are struggling to sustain their power. To make REDD+ work it is important to understand all actors before they can understand REDD+. REDD+ is unlikely to embrace success if state actors manage the REDD + mechanism unilaterally ignoring the roles of the various actors.

REDD+ is not only about how to manage forests now, but more notably it is about future commitment. State actors are in power for a very limited time, rarely for more than five years. We should remember that often successors neglect or change previous policies and decisions while local communities will continue to live in or near forests far into the foreseeable future. Therefore, the interests of long-term future stakeholders, such as local communities, need to be well represented for REDD+ to be sustained.

This paper describes policies and actors' knowledge and power in terms of implementing REDD+ in Jambi. By analyzing the actors and mapping their political interests and associations, this paper will contribute to the empowerment of key REDD+ stakeholders in Jambi Province as well as provide a model for other Indonesian provinces and other parts of the world.

Figure 1. Situation map of Jambi Province, Indonesia

CONTEXT

2.1. Administration

Jambi Province, covering 53,436 km² and comprising 51,000 km^2 of land and 426 km^2 of sea, was formed in 1958. It is located on the east coast of Sumatra (Figure 1). The total population in 2008 was 2,788,269 (54 people per km^2) with a growth rate of 1.68%. Agriculture is the most common occupation in Jambi (55.1%) followed by trade (15.9%), services (13.7%), transportation (4.9%), construction (4.45%) and industry (3.6%) (BAPPEDA, 2009).

There are 11 districts in Jambi Province (Table 1), with 128 sub-districts and 1,329 villages. Jambi City is the capital of Jambi Province as well as the centre of business in Jambi. GOLKAR (*Partai Golongan Karya* or The Party of the Functional Groups) followed by PAN (*Partai Amanat Nasional* or National Mandate Party) and PDIP (*Partai Demokrasi Indonesia - Perjuangan* or Indonesian Democratic Party – Struggle) dominated the Jambi parliament. The Jambi parliament comprises 39 males and 6 females, 11 of whom are from GOLKAR.

Table 1. Eleven districts and Cities of Jambi Provinces (BAPPEDA, 2009)

No.	Name of District/City	Number of		Extent	Population	Population density
		Sub-district	Village	(km^2)	(People)	People km^{-2}
1	District of Kerinci	12	209	3,808	322,322	84.6
2	District of Merangin	24	167	6,380	286,792	45.0
3	District of Sarolangun	10	131	7,820	219,472	28.1
4	District of Batanghari	8	114	4,983	223,061	44.8
5	District of MuaroJambi	8	133	6,147	301,082	49.0
6	District of Tanjabung Barat	13	70	4,870	247,487	50.8
7	District of Tanjabung Timur	11	93	5,330	211,560	39.7
8	District of Bungo	17	145	7,160	273,004	38.1
9	District of Tebo	12	95	6,340	265,547	41.9
10	City of Jambi	8	62	250	454,970	1820
11	City of Sungai Penuh	5	395	392	77,315	197.2
		128	1329	53,480	2,882,612	53.9

2.2. Forest cover and organization

In Indonesia forests are classified as forest areas (state owned property) and non-forest areas (community owned property). The government defines forest areas as *a specific territory of forest ecosystems determined and or decided by the government as a permanent forest.* Forest areas are legally determined by the government and currently not all forest areas are covered by trees. Forest areas, based on Ministry of Forestry regulation No. 412/Kpt-II/1999, are categorised into four types: conservation forest, protected forest, production forest (full and limited) and conversion forest. Forest areas outside designated forests are referred to as 'other land use' (*Areal Penggunaan Lain* or APL). Based on the Landsat ET+7 satellite image interpretations in 2006, the forest cover for each forest category and other land use are shown in Table 2.

Table 2. Forest cover inside and outside forest area in Jambi (in 1000 Ha; MoF, 2010a)

Forest cover	Forest area						Other land use (APL)	Total
	Permanent forest				Conver-sion forest	Total forest area		
	Conser-vation area	Protection forest	Limited production forest	Full Production forest				
Forest	589.4	134.3	188.1	498.9	0	1,410.7	161.2	1,571.9
Non-Forest	122.1	38.7	107.0	499.5	0	767.3	2,409.0	3,176.3
Data defi-ciency	6.3	1.3	5.5	11.8	0	24.9	39.0	63.9
Total	717.8	174.3	300.6	1,010.2	0.0	2,202.9	2,609.2	4,812.1

2.3. Forest Policy

Indonesia's legal framework has established certain goals for the forestry sector, including economic outputs, equitable distribution of benefits to improve people's welfare, watershed protection, and conservation. It is in line with the Indonesian Forestry Act No. 41 Year 1999, which states "Forest is a blessing controlled by the State to provide multiple uses. It should be managed, utilized, and maintained for people's maximum welfare in a good, fair, wise, transparent, professional and accountable manner. Sustainable forest management should accommodate community aspirations and participation, customary, cultural, and social values". Also, forestry administration "shall be based on benefits and sustainability, democracy, equity, togetherness, transparency and integration" and "shall be oriented for people's maximum welfare based on equity and sustainability principles." (The World Bank, 2006).

Based on the current issues facing Indonesia's natural resources, the forestry sector, with regard to the Midterm National Plans, focuses on environmental development and disaster management. The forestry sector will support reform within the government at all levels and good governance as well as harmonize various regulations, which will involve the development of food security and public infrastructure and integrated spatial management. The government aims to make the forestry sector useful for the economy, environmental quality and people's welfare. For the next five years the Indonesian Ministry of Forestry has eight policy priorities (MoF 2010b), which include to:

- Consolidate and stabilize forest areas
- Reforest and improve carrying capacity of watersheds
- Secure forests and control forest fires
- Conserve biodiversity
- Revitalize forest utilization and industries
- Improve local communities living in or near forests
- Mitigate and adapt forestry sectors to climate change, and
- Strengthen forestry institutions.

The four development priorities for Jambi Province, according to the Long Term Development Plan (RPJP) 2005-2025 and Mid Term Development Plan (RPJM) 2010-2025 include the improvement of: basic infrastructure, human resources and culture, institutional arrangements, and management of natural resources and environment. Jambi Forestry Unit programmes that contribute to the achievement of the provincial government programmes include: (a) combating illegal logging and illegal non-timber products; (b) law enforcement; (c) control of forest areas; and (d) revitalization of forest industries.

2.4. Deforestation and Forest Degradation

Conversion to agricultural plantation, mining, transmigration, fire and encroachment are the main causes of deforestation in Jambi. This is mostly in production forests, followed by limited production forests, conservation areas and protected forests which, between 2003 and 2006, amounted to 34,787.5 ha (Table 3). This rate of deforestation may, in part, be due to the lack of conversion production forest i.e., forest intended for conversion to agricultural land or other land uses, in Jambi.

Due to deforestation and forest degradation Indonesia has become one of the largest emitters of greenhouse gases (GHG) in the world. The sources of carbon stock in forests comes from forest cover, agro-forestry, plantations, fallow land, grassland, shifting cultivation/garden, housing compounds and surrounding and mixed unproductive land. Emissions from the forestry sector occurs as carbon stocks are depleted and released into the atmosphere when forests and other woody biomass stock, and grass lands, are converted or land management ceases, and forest fire (PEACE 2007).

Table 3. Deforestation in Jambi 2003 – 2006 (Jambi Forestry Unit, 2008)

Deforestation in	Forest area					
	Permanent forest				Non permanent forest	
	Conser-vation area	Protec-ted forest	Limited production forest	Production forest	Convertible production forest	Total
Primary forest	14.6	0	760.4	20.8	0	795.8
Secondary forest	1,451.1	378.2	4,024.6	18,756.8	0	24,610.7
Other forest	0	0	0	9,381.0	0	9,381.0
TOTAL	1,465.7	378.2	4,785.0	28,158.6	0	34,787.5

The direct drivers for deforestation and degradation differ in each country. The drivers of deforestation and degradation in Indonesia can be categorized into direct drivers and underlying causes. The direct drivers are natural causes and human activities (e.g. logging, illegal logging, forest fires related to land preparation for forest plantation and estate crops and mining). The underlying causes of deforestation and degradation are market failures, policy failures, governance weakness, and broader socio-economic and political issues (Contreras-Hermosilla 2000). Prioritise development over conservation clearly caused deforestation (Hansen *et al.* 2010).

METHODS

We used stakeholder analysis as described by Schmeer (1999) and also political mapping as described by Brinkerhoff and Crosby (2002). Brinkerhoff and Crosby (2002) proposed tools for stakeholder analysis, policy typology and political mapping to understand the policy reform process. They suggest that stakeholders be categorized based on the groups' interests in the various issues pertaining to REDD+, available resources, resource mobilization capacity and position in the issue. The stakeholder analysis can yield useful and accurate information about people and organizations that have interests in REDD+. This information was used to provide input for institutional and political mapping, and later to develop action plans and to guide a participatory, consensus-building process. Schmeer (1999) proposed eight steps for stakeholder analysis i.e. (a) planning the process; (b) selecting and defining policy; (c) identifying key stakeholders; (d) adapting the tools; (e) collecting and recording the information; (f) filling in the stakeholder table; (g) analyzing the stakeholder table; and (h) using the information.

The political map simplifies the real world into horizontal and vertical dimensions. The vertical axis constitutes the political actors that are categorized into four sectors external sectors, social sectors,

political parties and pressure groups. The horizontal axis assesses the degree to which each group supports the government (Brinkerhoff and Crosby, 2002).

RESULTS

4.1. REDD+ Policy Characteristics

REDD+ policy is intended to develop actions to reduce carbon emissions through reducing deforestation, forest degradation and enhancing carbon stock in forests, ultimately, to reduce global warming. It is expected that concerted efforts on the part of all stakeholders could reduce carbon emissions below business as usual (BAU).

The impetus for the REDD+ policy has come mainly from developed countries and is now a global concern. REDD+ is voluntary and will adopt market mechanisms to ensure the opportunity costs of reducing carbon emissions are compensated. However, while the cost of not logged forests, for instance, is clear, the benefits will depend on the readiness of the REDD+ market.

The government bears the cost of formulating, communicating and implementing REDD+ policy at different levels. Aid from donors, particularly from Norway, Australia and international agencies, have already arrived to support REDD+ implementation. The cost of transitioning can be categorized as short term, medium term and longer term. The short term is mainly for capacity building and meeting the funding gap. The capacity building embraces research, analysis and knowledge sharing, policy and institutional reform and demonstration activities. The medium term involves costs for determining effective national targets, monitoring-reporting-verification (MRV), link forest carbon credits and markets and advocacy for good governance. The longer term embraces costs for inclusion in the global carbon market (Eliasch, 2008).

REDD+ policy is quite complex, its issues are shown in the mind map in Figure 2, which covers scope, spatial scale, approach, undesired outcomes, reference level and MRV. The MRV system requires remote sensing technology to develop reference levels and monitor change. REDD+ requires commitment and change of behaviours from various actors who deal with forests directly and indirectly as well as creating the demand for REDD+ credit. The complexity of REDD+ requires the involvement of many institutions such as Ministries of Forestry, Agriculture, Provincial Land Use Planning Unit, business companies and NGOs. This complexity implies administrative commitment to manage and make REDD+ work.

The policy change process will not occur instantly. Policies at the national level need to be translated to provincial and district levels. The same broader policies need to elaborate detailed regulations. Real change will take time from understanding the policy, capacity building and developing plans at different levels to the implementation of REDD+, scheduled for after 2012.

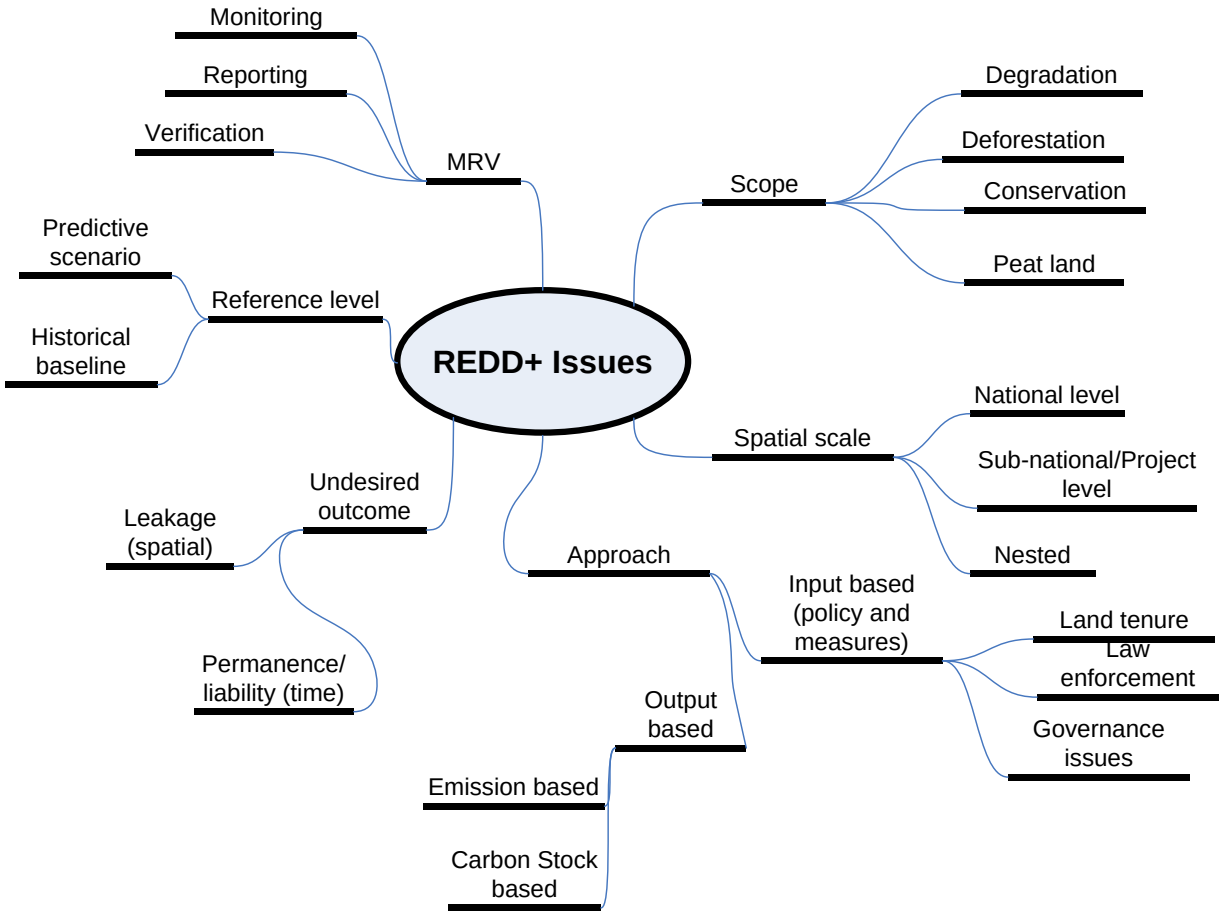

Figure 2. REDD+ issues

Following Brinkerhoff and Crosby (2002) Table 4 shows the characteristics of REDD+ policies in Jambi, a simple test of the viability of the implementation of REDD+ policy. Column A indicates simplifying factors, Column B neutral, and Column C complicating factors. We found that the total number of checks in Column C is much bigger than Column A. This suggests that REDD+ policy will be very hard to implement.

4.2. Stakeholder Analysis

The interviews for the stakeholder analysis were carried out in May 2010.

4.2.1. Selecting and defining policy

The analysis focused on REDD+ policy at the provincial level. REDD+ provides a new framework to allow deforesting countries to break this historical trend of deforestation and degradation.

The government of Indonesia, under National Appropriate Mitigation Actions (NAMAs), has committed to reduce carbon emissions by 26% (0.767 Gt) below BAU by 2020 without international assistance and 41% (1.189 Gt) with financial assistance from donor countries from the projected 2.95 Gt (Figure 3). The forestry sector is in charge of more than half (14%) of emission reductions.

Table 4. REDD+ policy characteristics in Jambi: A. Simplifying, B. Neutral, C. Complicating factors

	Simplifying factors (A)		B	Complicating factor (C)	
Where did the impetus for the policy come from?		Inside the country		Outside the country	V
		Inside the government	V	Outside the government	
Who decided the policy and how?	v	With democratic legislative process		Without democratic legislative process	
		With widespread participation	V	Without widespread participation	
What is the nature of the benefits and to whom do they accrue?		Visible		Invisible	V
		Immediate		Long term	V
		Dramatic	V	Marginal	
What is the nature of the costs and who bears them		Invisible		Visible	V
		Long term		Immediate	V
		Marginal	V	Dramatic	
How complex are the changes?		Few changes		Many changes	V
		Few decision- makers		Many decision makers	V
		Small departure from current practices, roles, and behaviours		Large departure from current practices, roles and behaviours	V
		Limited discretion		Large discretion	V
		Low technical sophistication		High technical sophistication	V
		Low administrative complexity		High administrative complexity	V
		Geographically concentrated		Geographically dispersed	V
		Normal pace		Urgent/emergency pace	V
		Single event		Permanent changes	V
		Low level of conflict about nature and value of the changes		High level of conflict about nature and value of changes	V
Total score	1		4		15

The provincial government of Jambi has developed Local Appropriate Mitigation Actions (LAMAs) and plans to reduce carbon emissions by 70 $MtCO_2eq$ in 2020. Fire prevention will contribute 26 Mt CO_2eq (37%) to the reduction of CO_2, sustainable forest management 22 Mt CO_2eq (32%), peat management 10 Mt (14%), and various other actions 12 Mt (17%). This will require a budget of US$400 millions.

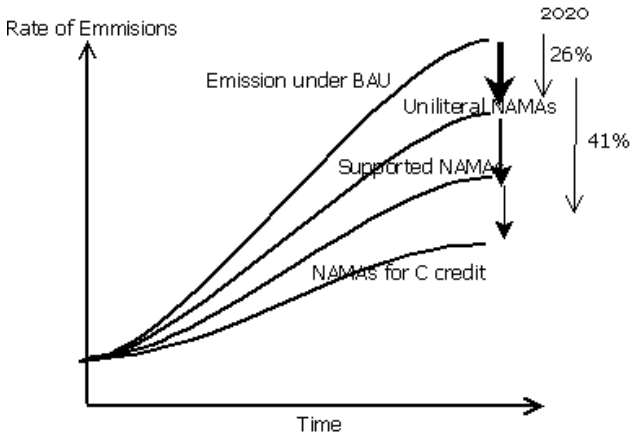

Figure 3. NAMAs are intended to reduce carbon emissions

4.2.2. Identifying key stakeholders

We started by identifying all possible stakeholders by reviewing the existing information including provincial workshop (conducted in January, 2010) results, stakeholder consultations and mass media. The main criteria for identifying the key stakeholders were: proximity to forest, legal rights, knowledge of REDD+, traditional rights and cultural. Annex 2 shows the 30 selected key stakeholders and the reasons for selecting them. We then grouped them into eight sectors. Since resources and time were limited, we prioritized stakeholders (based on their availability) to be interviewed, as marked with 'v'.

4.2.3. Adapting the tools

We developed a questionnaire to understand the stakeholders' characteristics and their opinions of REDD+. It shows their level of knowledge, leadership, and their related position on REDD+. They can be supporters, neutral or opposers of REDD+.

4.2.4. Collected and recorded the information

The interviews with the key stakeholders were conducted in May 2010. All stakeholders received us well and spent some of their time with us. Additional data like plans, monographs, newsletters and statistical data were also gathered after the interviews.

4.2.5. Analysis of the stakeholder tables

The information was then summarized in three tables of results i.e. knowledge level (Table 5), power and leadership (Table 6), and actors' position to support or oppose REDD+(Table 7).

Table 5. Stakeholders level of knowledge on REDD+

Stakeholder type	Knowledge Level		
	High	Medium	Low
General public entities		V	
Forest and land use public entities		V	
Political entities		V	
Business entities			V
Local farmers			V
Universities and research institutes	V		
NGOs		V	
International agencies/donors	V		

Table 6. Leadership and power on REDD+ in Jambi

Power&Leadership	Low Leadership	High Leadership
Low power	Local farmers	Environmental Prov. Agency NGOs
High power	General public entities Business entities Provincial Transmigration Unit Provincial Plantation Unit Political entities Provincial Forestry Unit	International agencies/donors

First we categorised the stakeholders by types rather than individuals (Table 5). The Universities, research institutes and donors had more knowledge of REDD+ than business entities and local farmers. Forest and land use public entities, political entities and NGOs had a medium level of knowledge. They are frequently involved in discussions on REDD+ at local and national levels. However, they seldom fully understand REDD+. General public entities, business entities and farmers had low level of knowledge and therefore understanding of REDD+. They had heard about REDD+ but had no idea at all how it might be implemented.

Table 6 shows the relative power and leadership of the stakeholders. Local farmers were not informed about REDD+, had no leadership and definitively low power. NGOs had high leadership but low power. The leadership came from the fact that they were informed about REDD+ and they were involved in various initiatives, workshops or projects on REDD+. Environmental agencies, located in the same quadrant had knowledge and leadership, but low budget to influence the REDD+ process. The general public entities, business entities, transmigration and provincial plantation units had power to influence policy but they did not have leadership in REDD+. The public entities such as BAPPEDA could make plans and allocate more government budget to endorse REDD+. Business entities like oil palm plantation owners had power to plant oil palm on degraded land only. The transmigration Unit can shift the current policy to only migrate people not to pristine forests and not cut forests for agricultural land. Provincial agricultural plantation unit can develop policies to intensify agricultural land and not to extend agricultural land into forested areas. Political entities, in democratic countries, including Indonesia, have power to influence those in power and shape budgets, rules and regulations. The Provincial Forestry Unit had power over forest management. It, however, needed to increase its concern and leadership to reduce deforestation and degradation at all costs.

International agencies/donors in fact had leadership in REDD+ due to their access to global knowledge and involvement in various forums such as UNFCCC. The agency had power to influence because they had money and networks to available funding. Indeed, the REDD+ campaign at the international level is very proactive and is now on the global agenda.

The position of each stakeholder type on REDD+ is given in Table 7. Most stakeholders either support or are neutral on REDD+ initiatives, plans and actions. The general public entities such as BAPPEDA are aware of the issues and will support REDD+ if placed on the government agenda. From our survey we could see no self initiative or planned action related to REDD+. The Provincial Agricultural Unit continues to complain that there is no longer land for agriculture expansion. The Forestry Units support the REDD+ idea, since it has already been scheduled by the central government. Surprisingly, the political entities support for REDD+ is partly only because it is in line with public concerns regarding community and environmental issues. Business entities were worried that if REDD+ were implemented they would not be able to utilise or convert their concessions and would have to put more effort and funding into conservation. The local farmers had no idea of what or how REDD+ would be implemented. Strong support came from universities and research institutes that believe REDD+ could save forests. NGOs support REDD+, but are concerned that local community rights not be overlooked. Strong support also came from the international agencies/donors of REDD+.

Table 7. Stakeholders' position on REDD+

Stakeholder type	Support	Neutral	Opposition
General public entities		V	
Forest and land use public entities	V	V	
Political entities	V		
Business entities		V	V
Local farmers		V	
Universities and research institutes	V		
NGOs	V	V	
International agencies/donors	V		

4.3. Political Mapping

REDD+ policy needs support and resources if it is to be successfully implemented. Policy change and politics 'who gets what, when and how' are intimately related (Lasswell, 1958) . In democracy, public officials need to operate in ways that respond to their citizens' needs and desires, balance special interests against equity and distributional considerations, and generate political backing. To be successful policy makers need capacity to assess the political environment for decision-making and the ability to develop strategies that will obtain additional resources for the policies (Brinkerhoff and Crosby, 2002).

Figure 4 shows the analytical approach for describing a political map of REDD+ policy. The vertical axis shows the political actors organized into five sectors: external sectors, government sectors, social sectors, political parties and pressure groups. The horizontal axis is the degree to which each group supports the policy. Support for the government varies from 'core' or 'central support' to 'ideological' or 'moderate support'. Support and opposition are labelled 'left'or 'right'. 'Left' indicates the groups that are more 'progressive' or 'interventionist' and 'right' indicates more 'conservationist' or 'less interventionist' than the government. This judgment was situational and dependant on the policy context. The legal opposition points to disagreement with policy, but they firmly support the rules of the political system. Anti-system opposition shows not only opposition to the policy, but also how decisions are made. They do not follow the norms of the existing system (Brinkerhoff and Crosby, 2002).

	Opposition		Support			Opposition	
External sectors				EU-FLEGT office Norway Australia			
Sector position	Anti-system	Legal opposition	Ideological support	Core Support	Ideological support	Legal opposition	Anti-system
Governmental sectors				**DisHut** BLHD	Bappeda BPN BPS Distrans	Disbun	
Social Sectors			Farmers	CIFOR ICRAF		Oil palm companies Forest plantation companies	
Political parties			PAN				
Pressure groups			WARSI SETARA				

Figure 4. Political map of REDD+ Policy in Jambi

Since the District Forestry Unit (DISHUT) in Jambi is the primary government focus of decision making, regarding how REDD+ is arranged, it is placed at the centre of the map. It is supported firmly by external sectors EU-FLEGT office, Norway and Australia. Although, all government sectors support the policy, we distinguish them by putting BLHD for core support and others i.e. BAPPEDA, BPN, BPS and DISTRANS for ideological support. We believe DISBUN is unlikely to support the REDD+ policy for fear that the policy will weaken their chance of more land for plantation development.

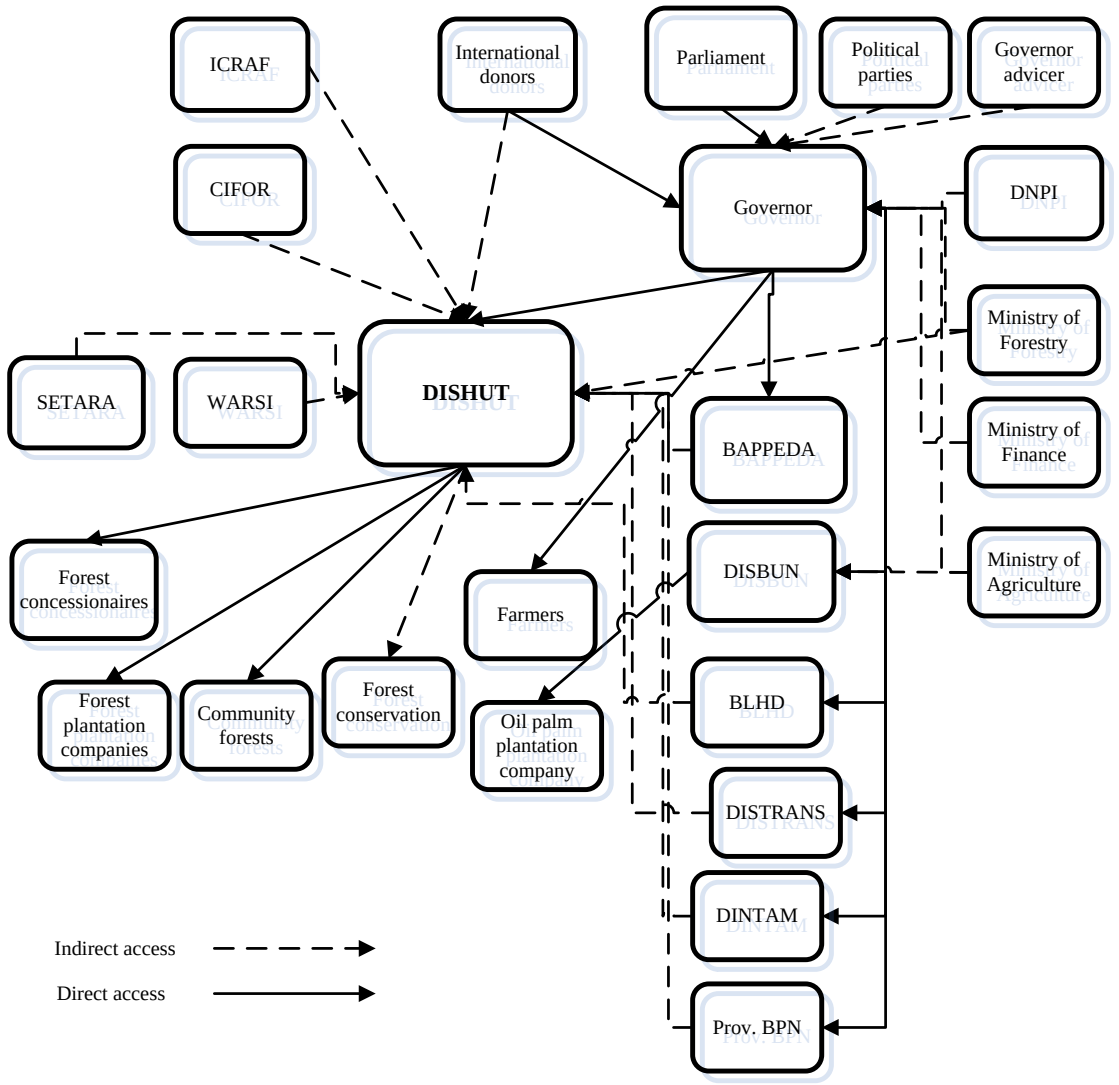

Figure 5. REDD+ policy network map in Jambi

Research organizations from the social sector support the idea of REDD+ and provide knowledge on REDD+. Oil palm companies will oppose REDD+ if prohibited from extending oil palm plantations. The governor's office, which is supported by the political party PAN, supports the policy as a way to manage forests sustainably and sustainable agriculture without slash and burn. NGOs, as pressure groups, support the policy but are pushing for more comprehensive and immediate approaches to improve local community livelihoods. They also believe that local community rights to carbon need to be clarified before the REDD+ policy can work.

4.4. REDD+ Policy Network Map

A policy network map is useful for concentrating on a particular policy idea and understanding the power access among various stakeholders. Figure 5, a simplified policy network map for REDD+ in Jambi, shows actors who have access to decision makers (solid line direct access) and dashed line indirect access).

NGOs (SETARA and WARSI) can advocate DISHUT just as much as research organizations such as CIFOR and ICRAF. National institutions such as DNPI (National Climate Change Council) and ministries can provide the governor with information and knowledge. Parliament and international donors have direct access to the governor and therefore are able to influence decisions made by the governor. DISHUT manages forest areas, while DISBUN manages agricultural plantations; both are under the direction of the governor.

DISCUSSION

REDD+ policy will be difficult to implement in Jambi due to low implementation capacity. While the stakeholder knowledge level is medium their support of REDD+ ranges from 'Medium' to 'Neutral'. Currently implementation lies with the 'Hard' policy characteristics and 'Medium' stakeholder's knowledge and support. The REDD+ political environment has mostly only ideological support for REDD+. This situation can be illustrated in a two dimensional matrix as in Figure 6. Without serious effort, implementation of REDD+ in Jambi will most likely fail. This situation looks even worse when we realize that only International agencies/donors have high leadership and power to implementing it. The Provincial Environmental Agency and NGOs have high leadership but no power. In the context of Figure 6, we have to move the current situation into a different quadrant where the policy is easier to implement and improve stakeholder knowledge, support and the political environment. Now we need to revisit the REDD+ policy characteristics in Jambi as given in Table 4.

		Implementation of REDD+ Policy		
		Difficult	Medium	Easy
Stakeholder Knowledge and support level mode	High			Goal: Highest probability of success
	Medium	**Current situation**		
	Low	Lowest probability of success		

Figure 6. REDD+ Policy characteristics and stakeholder knowledge and support

First we have to localize REDD+ issues. Although we understand the REDD+ initiative, we need to synergize it with the needs of national and local development, making low carbon development a local intuitive to meet local needs (Irawan and Tacconi, 2010). Local actors have capacity to articulate sustainable forest management and development in local context (Purnomo *et al.* 2005). Trade-offs and complementarities between global environmental benefits and local profitability should also be considered (Murdiyarso et al. 2002). Communications and campaigns are of utmost importance if local actors' mind-sets, are to be change.

The second one is to make the benefits of REDD+ visible and immediate. A lot of REDD+ discussions at national and global levels are now focusing on carbon accounting and governance. While these discussions are very important, local actors require something more tangible both in time and space. Without the latter it will be difficult to attract local actors to any form of REDD+. Clearly identified buyers can help to provide something more tangible.

The third is to deal with the constraints; the costs of REDD+ are visible and immediate. A halt to current practices that result in carbon emissions such as clearing forests, illegal logging and slash and burn are needed to reduce emissions. Furthermore, proof of additionality, avoiding leakage, establishing MRV (carbon Monitoring, Reporting and Verification) and finding buyers are also urgently required. All are visible costs, and also happen immediately. These costs must be shared and acceptable for local and key actors, particularly those who need to change their livelihoods. A part of the cost is transaction costs. Reducing transaction costs will provide greater benefits for the real carbon players. This could be achieved by, for example, reducing carbon trade brokering using internet marketing portals for REDD+. International donors and agencies need to share the costs.

If the number of buyers increases, then the demand will increase. For this to happen, it is extremely important for COP (Conference of the Parties) negotiations, and the like, to be successful. Carbon decreasing agreements among countries must be clear, large and binding. Connecting to local and visible markets e.g. Garuda Airlines, will provide two benefits, first closer to the market usually means greater benefits; and the second an increase in local carbon trading.

The last challenge is how to simplify and avoid major changes such as those from REDD to REDD+ where associated policies have become increasingly complicated and much more difficult to implement. The challenge is to improve the policy, not necessarily to perfection, while making sure it works. To make REDD+ work changes should be few and small, if any, not dramatic, few decision makers, fewer regulations, limited bureaucracy, single events and low level of conflict and all introduced at a 'normal' (not too fast) pace. We need a simpler REDD+ mechanism, for example the Brazil model, which is based on grants to reduce carbon emissions, and avoid the market mechanism. Starting from conservation areas will have a lower impact on local livelihoods, which should make it easier to implement REDD+. Although this will not reduce carbon emissions dramatically it will increase support for REDD+.

Another way to reduce complexity is to create a 'superbody' for REDD+. This superbody should manage the REDD+ mechanism without confusing everyone. This superbody could overcome the vulnerability of REDD+ policy in which actors have various levels of leadership and power. Such an institution might emerge from the National REDD+ Task Force, under UKP4, which is currently headed by Kuntoro Mangkusubroto and Heru Prasetyo as head and secretary of the task force.

To strengthen REDD+ policy support we also need to disseminate REDD+ knowledge to those who have power but low leadership i.e. general public entities, business entities, Provincial Transmigration Unit, Provincial Plantation Unit, political entities and the Provincial Forestry Unit. Once these leaders are knowledgeable about REDD+, implementation will be easier.

It is also necessary to provide livelihood alternatives for those who have low power and low leadership, particularly local farmers and communities. It is important to ensure that they are not worse off with REDD+. If they are better off with REDD+, they are more likely to support or even provide leadership for REDD+.

Government support, particularly funding, is extremely important for those who have leadership but low power. The Environmental Provincial Agency needs additional budget to communicate REDD+ to all stakeholders. The government budget is the common source of funding. Grants from foreign agencies and co-operations are needed to boost and support the agency's leadership.

NGOs such as WARSI which also have high leadership and uncertain budget should be empowered by connecting them to international agencies and cooperation. They can be very effective particularly in facilitating local communities and civil society in general.

CONCLUSIONS

REDD+ policy right now in Jambi tends to have low implementation capacity. This situation is frustrating as the actors who have high leadership are not in power. For a policy to work we have to change the direction of the current situation where the policy is easier to implement and able to improve stakeholder knowledge, support and the political environment. The complicating factors of REDD+ policy need to be simplified by, among others, giving better space for local initiatives, showing real benefits to actors, reducing complexity by developing a super-body. Empowering those who have low power but high leadership is as important as the effort of influencing those who have low leadership but high power.

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Annex 1. List of Abbreviations

BAPPEDA	Regional Planning Agency
BAU	Business As Usual
BLHD	*Badan Lingkungan Hidup Daerah* (Environmental office at provincial level)
BPN	*Badan Pertanahan Nasional* (National Land Use Agency)
BPS	*Badan Pusat Statistik* (Center of Statistical Agency)
CO_2	Carbon Dioxide
COP	Conference of the Parties
DISBUN	*Dinas Perkebunan* (Plantation Provincial Unit)
DISHUT	*Dinas Kehutanan* (Forestry Provincial Unit)
DISTAN	*Dinas Pertanian* (Agricultural Provincial Unit)
DISTRANS	*Dinas Pertambangan* (Transmigration Provincial Unit)
EU	European Union
FLEGT	Forest Law Enforcement, Governance and Trade
GHG	Greenhouse Gases
GOLKAR	*Partai Golongan Karya* (Party of the Functional Groups)
LAMAs	Local Appropriate Mitigation Actions
MoF	Ministry of Forestry
MRV	Monitoring Reporting Verification
NAMAs	National Appropriate Mitigation Actions
NGO	Non-Governmental Organization
PAN	*Partai Amanat Nasional* (National Mandate Party)
PDIP	*Partai Demokrasi Indonesia - Perjuangan* (Indonesian Democratic Party – Struggle)
PEACE	Pelangi Energi Abadi Citra Enviro (a company)
REDD	Reducing Emissions from Deforestation and Degradation

RPJM	Mid Term Development Plan
RPJP	Long Term Development Plan
UKP4	*Unit Kerja Presiden bidang Pengawasan dan Pengendalian Pembangunan* (Presidential Working Unit for Supervision and Management of Development)
UNFCCC	United Nations Framework Convention on Climate Change
WARSI	Indonesian Conservation Community (a NGO network)
WWF	World Wildlife Fund

Annex 2. List of REDD+ stakeholders in Jambi

No	Sector	Stakeholder	Reason for selection	Priority
1	General public entities (Government)	BAPPEDA)	Land use planning and budget allocation to include REDD possible area and finance	v
2		BPN at Provincial level	Land use authority outside forest area. REDD may locate outside forest area (kawasan hutan)	
3		BPS	Office for supplying land use data	
4		BLHD	Focal point of REDD+ policy and its implementation	v
		Finance Provincial Unit (*DINAS KEUANGAN*)	Responsible for government income and budget planning that may include REDD+ business	
5	Forest and land use public entities (Government)	Forestry Provincial Unit (DISHUT)	Responsible for forest area management and policy	v
6		DISBUN	Manage and control agricultural plantation that may jeopardize forests	v
7		DISTAN	Manage and control agricultural seasonal plantation that may jeopardize forests	
8		DISTRANS	Responsible for people migration to Jambi that may be located in forest area	v
9		Mining Provincial Unit (*Dinas Pertambangan*)	Responsible for mining policy that may be located in forest area	
11	Political entities	Parliament	Have significant impact in REDD+ related regulation and policy formulation. They can control REDD+ policy implementation	
12		Governor adviser/PAN	Responsible for implementing plant and coordinate the public institutions	v
13	Private entities	Forest concessionaires	Could be area for REDD+	v

14		Forest industrial plantation	Could be area for REDD+	v
15		Mining companies	Could be area for REDD+	v
16		Palm oil companies	Could be area for REDD+	v
17		Rubber owners	Could be area for REDD+	
18		Cinnamon plantation owners	Could be area for REDD+	
19		Coconut plantation owners	Could be area for REDD+	
20		Ordinary farmers	Could be area for REDD+	
21		Urban citizen	advantage or disadvantage from REDD+	
22		Carbon Broker	Connecting service providers and buyers that make REDD+ work	v
23		Carbon Buyer	Provide demand for REDD+ activities	v
24	NGOs	WARSI	Advocacy for REDD+	v
25		WWF	Advocacy for REDD+	
26		Wetland International	Advocacy for REDD+	
27		SETARA	Advocacy for REDD+	v
28	Universities and research institutes	Jambi University	Academicians to support/oppose REDD+	
29	International agencies/ donors	FLEGT office	External support to REDD+ policy or trade	v
30		Australian REDD+ donor	External support to REDD+ policy or trade	

World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

REDD-ALERT

ASB Partnership for the Tropical Forest Margins

SEVENTH FRAMEWORK PROGRAMME

The international REDD$^+$ debate has so far focussed on 1) the scope (RED, REDD, REDD$^+$) of efforts to reduce emissions from a subset of wider land-use issues; 2) the financial incentives ($/tCO$_2$e) and associated accounting and disbursement mechanisms; and 3) safeguards that local perspectives be taken into account ('free and prior informed consent') and biodiversity co-benefits be achieved. From the local perspective of stakeholders living in tropical forest margin, the REDD$^+$ debate is an additional complication in an already complex relationship that they have with central governments and forest authorities. Can they make use of the REDD$^+$ interest of their national government to further their livelihoods strategies and development aspirations? Or will the REDD$^+$ implementation measures set them back in their conflicts over resource access? We provide a number of case studies of two high carbon emission provinces in Indonesia, the land with the highest land-based carbon emissions. Conflicts over land are shown to be aggravated by a large REDD$^+$ pilot project in Central Kalimantan, but new forms of accommodating forest-edge villages in stabilising forest margins through 'village-forest' agreements in Jambi are promising to become a major part of the solution. A deeper analysis of the community-level motivation for resource protection and household decisions about preferred land uses revealed the importance of social context in land use decisions. The model representation of 'agents' interacting in dynamic land-use models have not so far captured the richness of influences and 'bounded rationality' beyond household level economic optimisation. A nesting of models is proposed that will describe interactions between natural, social, human, financial and physical capital at multiple scales, with the primary cross-scale interactions restricted to the various capital types, and the cross-capital interactions restricted to an identical scale. A stakeholder analysis of REDD$^+$ perspectives at provincial scale will be used in such models.