Developing a framework of interactions among stakeholders in the governance of Indonesian Forests

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Developing a framework of interactions among stakeholders in the governance of Indonesian Forests

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ABSTRACT

This review synthesises the literature studying interactions among stakeholders in Indonesian forest governance. Having described major trends in former studies, the study discusses evidences and best practices in the management of Indonesian forests. It then discusses the framework proposal for depicting interactions among government, local people, and private companies. Key aspects to consider in the discussion are how to design effective mechanisms and incentives that may minimize frictions among the stakeholders. Such mechanisms may lead to forest sustainability. The review concludes by discussing avenues for future research.

Key words: *Fo rest Governance, Interactions, Government, Local People, Private Companies*

Introduction

The world's tropical forests governance remains weak(Sundström, 2016), including in Indonesia (Alesina, Gennaioli and Lovo, 2019). Deforestation in the tropics recei 18 key attention in the perspective of worldwide climate change and biodiversity damages. Here, The Intergovernmental Panel on Climate Change (IPCC) emanates the farmings, forests, and other terrestrialusages currently contribute to a quarter of global greenhouse releases (Leblois, Damette and Wolfersberger, 2017). Economists had studied the causes of deforestation for years and across multiplelevels (Angelsen and Kaimowitz, 1999; Leblois, Damette and Wolfersberger, 2017). Recently, Leblois, Damette and Wolfersberger (2017) reveal that trade is the most important driver of deforestation, despite any other factors. In Indonesia,Burgess *et al.* (2012) find corruption is directing to deforestation and most currently Alesina, Gennaioli and Lovo (2019) find such deforestation positively linked to the level of tribaldivision.

A growing field of scholarly research has investigated forest governance with an output to minimize deforestation(Burgess *et al.*, 2012; Leblois, Damette and Wolfersberger, 2017; Wehkamp *et al.*, 2018; Alesina, Gennaioli and Lovo, 2019; Chaikumbung, Doucouliagos and Scarborough, 2019), nevertheless most of them treat the governance factors separately. Hence, our understanding of integrated forest governance is in need of further progress.

Wehkamp *et al.* (2018) suggest future research to evaluate how far governance in sectors outside the forest sector, may affect deforestation rates. Furthermore, they also suggest to analyse the impacts of forest governance within conservation setting as well as the fundamentalprocedures. In addition, a thorough analysis is also warranted on the deforestation patterns. Chaikumbung, Doucouliagos and Scarborough (2019) suggest future research to uncover the underlying channels of institutions im-

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provements to shed lights the dilemma between development and preservation.Galinato and Galinato (2013)suggest future studies to evaluate the contribution of other determinantson deforestation, e.g. rural poverty. Leblois, Damette and Wolfersberger(2017)find that most importantly, trade is playing an important role in leveraging deforestation. However, the impactrelies on the country's uniqueness and thus better-adjusted incentives per country are suggested. They suggest future research to elucidate variations in the rate of deforestation.Secco *et al.* (2014)suggest future research to explore the possibilities of rising up the local forest-governance metrics. Here, improvedmetrics are required for specific multifaceted elements and micro-elements of forest management.

The scholars' suggestions lead to the two aims of this review: First, to summarize the best practices and empirical findings from relevant literatures pertaining to forest management practices in Indonesia, in a thematic manner. Second, to model interactions among stakeholders of Indonesian forest governance.This studyrecognise that vital elements in designing interactions within forest management is the deliverance of optimal institutions mechanisms to reduce deforestation. Further research suggestions are then presented.

Studies on Indonesian Forests' Governance

Forest remains an important international issue. IPCCprojected 1.6 billion tons of carbon has been released each year as a result of land use in relation with tropical forest deforestation (Denman *et al.*, 2007). The governance of existing forests was suggested as the cheapest way to mitigate climate change (Leblois, Damette and Wolfersberger, 2017).

Deforestation is a destruction process of forest's top-soil by permanent changes of the land use. Tropical rainforest deforestation may increase greenhouse emission in the earth atmosphere, destroy forest habitat, and devastate society's life resources (Sunderlin and Resosudarmo, 1999). In 2005, Forest Resource Assessment (FRA) reported that deforestation progressed in a worrying level. International mitigations had been conducted, such as the initiative of United Nation Framework for Climate Change Convention (UNFCC) along December 2005 to 2007 to assess and reconsider the deforestation policy, especially in developing countries. Here, the focus was on knowledge sharing, methods and techniques of deforestation, including policy approaches and positive incentives (Leblois, Damette and Wolfersberger, 2017).

The deforestation issue remains a stable discourse as it benefits many stakeholders. Stemmed from the value-added of wood productions, many tropical lands had been transformed in a low economical level with an intention to attract investors.In addition, deforestations still exist albeit the Kyoto Protocol has arranged agreements and international regulations on deforestation and reforestation.

Indonesia possesses one of the widest regions of tropical forest worldwide. Ranked third after Brazil and Zaire, Indonesian forest area reaches 135 million hectares, covering 10 percent of the total world tropical forest (Department of Forestry of Indonesia, 2009). Such wide areas trigger parties and stakeholders to deliver deforestations for their own interests. Based on the data of Directorate of Forest and Land Rehabilitation, the Indonesian forest defores-

Table 1. Critical land areas across Indonesia in 2006 (in hectare)

ID	Land Function	Critical Land Categories			
		Semi-Critical	Critical	Highly-Critical	Total
I	Outside Area	16.082.933	8.587.558	2.102.753	26.773.245
24	Inside Area	31527.148	14.718.675	4.787.813	51.033.636
1	Conservation Forest	3.002.261	1.021.015	332.077	4.355.352
2	Protected Forest	6.051.764	2.527.270	724.664	9.303.699
3	Production Forest	8.919.109	4.284.581	2.052.204	15.255.895
4	Converted Forest	5.367.368	4.212.741	969.213	10.549.323
5	Limited Production Forest	8.186.644	2.673.067	709.655	11.569.367
	Total	47.610.081	23.306.233	6.890.567	77.806.881

Source: Department of Forestry of Indonesia (2009)

tation and degradation is increasing each year. The amount of 0.9 million hectares per year on 1982-1990 has increased into 1.8 million hectares per year on 1991-1997 and again it is increasing into 2.83 million hectares per year. Even though in 2006 there was a decrease about 1 million hectares per year, the pace of rehabilitation and reforestation only reaches 500.000-700.000 hectares per year.

The significant deforestation in Indonesia may stem from the definition bias of deforestation. It seems the definition has been inconclusive, since many questions arise: (1) Does deforestation mean the permanent loss of forest or it includes a temporary loss as well? (2) Does it mean the loss of forest cover for all purposes or the loss of forest cover for wood production? (3) Who are the deforestation actors? Are they who open forest cover or they who impede the re-growth of forest cover? (Sunderlin and Resosudarmo, 1999). The FAO & World Bank' research (Sunderlin and Resosudarmo, 1999) implicitly states that the losses of forest cover, either permanently or temporarily, are categorized as deforestation. In addition, the research explicitly states the area and the process of moving fields which may become a secondary forest are parts of deforestation. As such, the deforestation in Indonesia is constantly increasing.

The deforestation in Indonesia also improves critical land areas. Critical land refers to an unproductive land which could not be restored into farming land without significant efforts. This characterized with a very fast erosion process, causing fertile soil is getting thinner and suffered economic and environmental functions. Up to 2006, the critical land inside and outside the forest area were about 77.806.880 hectares. The details are shown in Table 1 as follow:

In all, while deforestation could degrade environmental quality, induce climate change, and produce excessive carbon emissions, it is still used as a main economical resource to stakeholders. The stakeholders in this study are: (1) Government, (2) Local people, and (3) Private companies.

Table 2 summarises the recent researches on the likely interactions among government, local people, and private companies in the forest management. It shows that the interactions among stakeholders definitely influence the management of forests and resources.

In the domain of the interaction between local people and deforestation, Fraser in William (1996) argues the growth of inhabitant density causes the deforestation problem in Indonesia, vice versa. Here, the illegal loggings conducted by companies are causing deforestation. The deforestation creates empty lands which then are used by moving farmers and as such, the deforestation increases population density in an area.

Another arguments state local people are significant determinant in reforestation efforts by redeveloping endangered lands and people-plant-forests (Obidzinski and Dermawan, 2010; Khasanah *et al.*, 2016; De Royer, Van Noordwijk and Roshetko, 2018). The replanting of endangered lands or the dormant lands utilizes economically-benefit plants through agroforestry system/mixed planting (Khasanah *et al.*, 2016). Besides the replant of endangered land, the interactions between local people and reforestation are emerged with the development of Integrated Forest Management. Part of such actions is the advancement of People-Plant-Forest (Obidzinski and Dermawan, 2010). Nevertheless, such KPH program needs support and fund-commitment from central and regional government.

Government acts as a regulator and facilitator who bridge the interactions among local people and companies so the deforestation activities conducted by the both parties could run in an efficient way, either from economic or environmental aspect. One way is through Reduction of Emissions from Deforestation and Forest Degradation (REDD), a program to reduce the level of forest deforestation and degradation with a goal to decrease emissions from such deforestation. However, the program left several trade-offs as follow: (1) The diminishing of incentives from industrial countries to reduce carbon productions; (2) The transfer of deforestation to regions uncovered by REDD; (3) The increasing disparities in regions where population lives in forests with unclear land status of possession; (4) The loss of cultural and biological diversity which indirectly in line with the measurement scheme of REDD; (5) The degradation of the meaning of community-based forest protection.

Therefore, government efforts to overcome deforestation through REDD still have some pitfalls. Participations are warranted from stakeholders in order to create balanced policies. The balance may lift a comprehensive planning and execution and then building trust toward REDD through participative dialogues (Hirsch *et al.*, 2011).

Table 2. Summary of previous researches on forest management

Study	Study Aim	Findings	Relevance with the Current Study
De Royer, Van Noordwijk and Roshetko (2018)	Assessing the progress of community-based forest management (CBFM) schemes in Indonesia across three provinces and three case studies.	The CBFM schemes lack in achieving goals and technical supports. Instead of empowering communities, the programme acted more as a problem-solving toolon forest tenure, legalization of forest communities and forest rehabilitation. Therefore, communities remain subject to land-use limitations.	The study indicates that rights redistribution only contributes to social justice when it acknowledges local aspirations and cultural values. Hence, more active interactions from local people with government and companies may be valuable.
Leblois, Damette and Wolfersberger (2017)	Updating the recent determinants of deforestation in tropical countries, using a new time-series-based data of satellite images	(1) Common drivers of deforestation tend to elucidate the deforestation in the 2000s, (2) Trade in forestry and agricultural commodities plays a main role in forest clearance (3) Population density does impact deforestation (4) The effect of trade is significant in forest-endowed countries	Trade plays a significant role in the deforestation pace. This may indicate an interplay between private companies and government in the forest governance. Moreover, an increasing population may intensify local people' interactions with local government in the forest use.
Workman, T. *et al*. (2015)	Describing the process of policy developments on customary forest in Bulukumba, Indonesia. The study asserts the importance of stakeholders commitment in recognising the rights of customary communities	Recognition of the rights of customary communities depend on the 'fair' regulation produced collaboratively by all stakeholders, as well as the commitment of to implement the regulation.	The study findings supports further studies on the interactions between local people, government (especially on developing regulations), and private companies in acknowledging the rights of local communities.
Obidzinski and Dermawan (2010)	Evaluating a community timber plantation programme in Indonesia called HTR (Hutan Tanaman Rakyat or community timber plantation) since 2006.	The HTR policy was poor in design and weak in implementation. The policy does deliver risks of encouraging illegal deforestation. Nevertheless, the policy remains have the potential to rehabilitate land, support the	The study recommends five policy adjustments in the areas of financial stability, legal, and transparency in land allocation and financing. Such suggestions mainly may relate to the interactions between local people and government.

Table 2. *Continued*

		wood-processing sector, and financial opportunities for rural Indonesian areas.	
Alesina, Gennaioli and Lovo (2019)	Investigating the contribution of the characteristics of local populations on illegal logging in Indonesia, an extremely ethnically diversed country	The level of deforestation in Indonesia positively relates to the degree of ethnic diversity. In addition, there is a trade-off between reduced ethnic heterogeneity and and escalated competition in the natural resource market	A properly aligned interactions between local people and government may be warranted since a more homogeneous ethnic group increases competition in the forest use.

Discussion

This study conducts literature review and proposes a conceptual framework of forest governance in Indonesia, following a multi-agents framework (see Figure 1). Central government act as a principal and the local stakeholders are the agent. The local stakeholders consist of municipal governments, forestry companies, and local forest communities. Municipal governments manage forests based on the regulations jointly developed with central government. The forestry companies and local forest communities within the jurisdiction of municipal governments must comply with the regulations on forest governance which are developed by the municipal governments.

The essential problem within the principal multi-agents framework is finding the institutional mechanisms that synchronize the interplaying interests of the agents with the goals of central government as the principal. In this sense, the goals of the principal could be attained even under a setting of asymmetric information. In this study, the main focus would be on finding alternatives of effective and efficient monitoring schemes regardingthe obedience of agents, in an economic context.

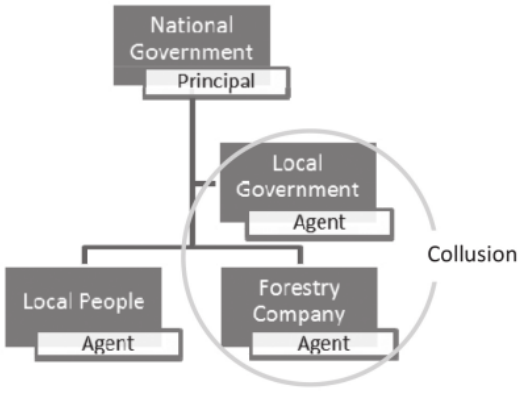

Fig. 1. The principal multi-agents framework for decentralized forest governance

The social circumstance in the forestry problems is marked with an imbalanced power among local stakeholders. Such power relationship related to a question on bargaining distribution among stakeholders: Do stakeholders possess a balanced power, or the power is concentrated in one or more stakeholders?

Theoretically, municipal governments have a higher hierarchical level than companies and local people. Nonetheless, there are three different scenarios in accordance to the power relationship between local officers and forestry companies. In the first scenario, the local officers have their authorities to manage forest activities in a local jurisdiction and to monitor the companies' obedience. Here, local governments act as the parties who decide the level of bribery and illegal deforestation. Provided the local governments do not want to be bribed, the companies must be able to avoid or hide such illegal deforestation. In the second scenario, the forestry companies may have a sufficient power to bargain, equally, with the municipal governments. Therefore, the bribe level and illegal deforestation would become a join decision between both parties. In the last scenario, the companies may possess a huge fi-

nancial power and political connection, and as such they may determine the level of illegal deforestation and bribery. Here, the local officers positioned to facilitate the companies decisions.

Regarding the role of local inhabitants, they may (or may not) have the bargaining power to influence decision making related to the forest use activities. Therefore, provided they do not possess power, the local people could only accept the consequences of decision making or the local people could organize and develop bargaining position to fight against the decisions created by the other stakeholders.

The varied scenarios on the power relationships among the stakeholders may influence the interaction patterns as well as the wealthy level among the stakeholders. Based on the above literature review and arguments, this study proposes the interaction patterns among stakeholders in Figure 2 as follows:

Figure 2 depicts interaction patterns in the usage of forest land. There are three main actors: (1) Government (central and local), (2) Private companies, and (3) Local people. They have their own interests which create an interaction patterns. At least, the interaction patterns are: (1) Government-local people, (2) Government-companies, and (3) Companies-local people. In addition, there are regulations (by government) intervene the relationship of local people and companies. Furthermore, non-government-organisation (NGO) has a non-regulation role such as monitoring the interaction of government and companies, government and local people, and the activities of forest resources use by companies and local people.

The interactions of local people and government

Local people or inhabitantswho livealong the forest region usually use forest as one of their livelihood through either consumption or production activities or housing. However, such activities often impact on the degradation of forest lands. For example, the forest and land use around TahuraNipa-Nipa (Indonesia) by the local people, especially in the south part, indicate a shift along 1990-2010 period. Here, the decreasing of forest area approximately around 2-12% per year (Widayati *et al.*, 2014).

The trade-off between the needs (or interests) of forest conservation and the usage of forest resources (as a livelihood for local people), pushes and emanates a need of regulation frameworks which may accommodate both interests. Community-based forest management (CBFM) is one of the regulation frameworks that arrange forest management. This program embraces the active participation of local people which cover local people livelihood and forest conservation. The CBFM indicates that society must be involved in the land protection efforts toward the sustainability of natural resources and environment. In addition, such strategy does have to consider the rights of land usage for the sustainability of local people. Here, the local people should be given access to the use of forest resources, with an agreement on tree species which will be planted in certain areas (Widayati *et al.*, 2014).

Wiersum (1997) arguesthat within CBFM, the required lists of local communities on the management of forest exploitation include: (1) Structures for

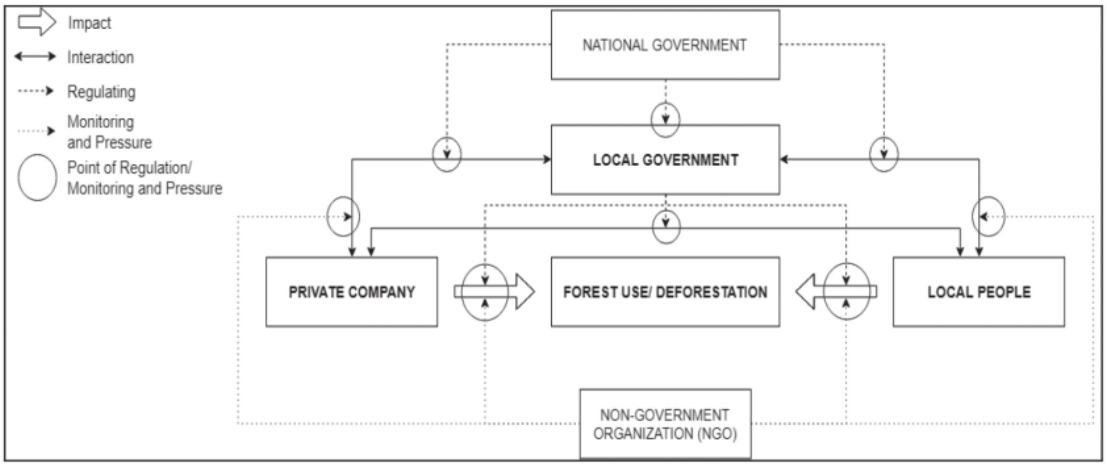

Fig. 2. The interaction patterns in the usage of forest resources

community member in accordance to the required human-resource management, (2) An adequate restraint of member behaviour which ensure the planning strategy and the management practices could be well-conducted, (3) the control of forest products distribution, and (4) the capability to 'discard' outsiders. In addition, the stimulus to improve local people participation in the conservation activities and forest management should not be based on the general policy of forest. Instead, the perspectives and the priorities of local people community should be in line with the professional foresters (government-owned organisations).

Nevertheless, the CBFM encounters application problems, especially in Indonesia. Although the program has a strong regulation framework within all levels, the government attention remains on the administrative matters (regulation) and as such the field verification did not run properly (in accordance to forest area exploitation). In addition, there is ignorance of forest management problems albeit the CBFM initial design was to solve the problem of land exploitation and conflict resolution (De Royer, Van Noordwijk and Roshetko, 2018). Further, De Royer, Van Noordwijk and Roshetko (2018) and Khasanah *et al.* (2016) add that new conflicts are emerged and the parties are returning to old habit (business as usual) or nothing changes. The lack of coordination and communication among government's departments and local people, as well as miscommunication on regulation interpretation, often yield conflicts.

Another factor is the minimal facilitation and technical guidance to main-target group within CBFM under relevant institution/unit (stemmed from the lack of fund). This creates a panic implementation process where the target group within society (usually the poor villagers and they who do not possess land) could not be embraced properly. The implementation and feedback of CBFM in society level are worsened by the poor coordination among institutions, role overlap, and lack of fund (De Royer, Van Noordwijk and Roshetko, 2018).

De Royer, Van Noordwijk and Roshetko (2018) find CBFM can only handle the problems of forest land possession, the legalization of forest community, and forest rehabilitation. However it cannot solve the problems of local people empowerment. The fact is, local people still have constraints on the opportunity to use forest land. In addition, the participation of local people remains insignificant and there is almost no coaching on financial and technical skills. Consequently, the implementation of CBFM could not deliver social justice to local people except by the acknowledgement and the improvement of local people' participation.

The interactions of private companies and government

The interactionsof private companies and government in the forest exploitationshad been occurred at Spain, Argentina, and Chile (Cubbage *et al.*, 2010; Vadell, De-Miguel and Pemán, 2016). In the middle of 18th century, Spain encounters a serious deforestation problem. Approximately Spain only had 12.5 percent out of its national forest territory. The massive deforestation stemmed from industrial activities which based on forest resources, a reality that occurs recently in developing countries (Vadell, De-Miguel and Pemán, 2016). This shows the role of companies in contributing to massive deforestation. Nonetheless, it indicates a dilemma since the massive deforestation is followed by the escalation of forest-based-goods needs. In dealing with such dilemma, a regulation framework is warranted to simultaneously accommodate forest conservation and companies' production demand.

In dealing with such dilemma, Argentina and Chile implemented certification policy on forest exploitation under consideration of environmental sustainability. The forest certification program is applied to optimise forest governance, forest protection, and social assistances through a possession of forest land and forest exploitation practices. Cubbage *et al.* (2010) assert such certification program in Argentina and Chile has successfully pushed companies to create policy changes in forest management and forest protection. Such changes include: (1) the limitation of chemical utilization, (2) the development of protection planning of endangered species, (3) the intensification of operational management practices, (4) the prevention of hostile-wild-plants' invasion, (5) biological diversification, (6) high conservation forest value, (7) the transparent preparation of forest-management plan, and (8) the arrangement of plantation-guidance meeting. Nevertheless, such changes spend relatively-enormous costs in complying standards of forest certification.

The triangle nexus: Interactions of private companies, local people, and government in the usage of forest resources

One of the drivers of the interaction patterns among companies, local people, and government is externalities emerged from the exploitation activities of forest land. For instance, forest land exploitation for production activities by companies may cause multi-dimensional impacts (social, cultural, economics, environment, health, and so on) toward local people. The externalities attract government involvement in curbing such problem. Along the last 30 years, Kajangtribal community who resides at Bulukumba-South Sulawesi (Indonesia) has lost most of their region. Here, a rubber company titled PT Lonsum owns 5,000 hectares of Land-Exploitation-Right areas, spreading around Kajang area at Bulukumba. The community currently only owns below 500 hectares of forest along their tribal region(Workman *et al*., 2015). A number of regulations obviously state the acknowledgement of tribal community and tribal area is an order from municipal government. However, municipal governments usually tend to govern and not acknowledge such tribal rights. Furthermore, the participation of tribal community remains insignificant.

Workman *et al.* (2015)suggest several actions to overcome the problems. First, issuance of regional regulations or at least Regent's decision letters which clearly acknowledge the existence of tribal communities and set their land. Second, collaborative attempts which could interpret the demand of stakeholders into proper regulations, based on representativeness, political, and operational aspects. Third, optimization of the facilitators' role as a developer and a trainer in building knowledge and technical skills of the regional parties to prepare their own regional regulations, and in assisting local people in leveraging their local knowledge. The certification programs on land use which has been implemented by Argentina and Chile governments may be a positive example, as it deliver changes in social aspect by conducting a routine public hearing (especially with the local people). The goal is to create harmony in land use activities (Cubbage *et al*., 2010).

In addition, the interaction does created by the mechanism of policy setting, based on participatory approach. The United Nations Intergovernmental Panel of Forest Program (UNIPFP) has declared that the national and sub-national forestry programs must implement the participatory mechanisms. An intense participation in policy setting could produce sustainable solutions in the exploitation of forest land. In Finland, the problems on participatory mechanisms are stemmed from the different interests of stakeholders pertaining to forest management. Moreover, approximately 60 percent of forest land is possessed by family entities (more than 300,000 owners). This creates disharmony in the participatory-based policy setting (Tikkanen, Hujala and Kurttila, 2016). Tikkanen, Hujala and Kurttila (2016) argue Decision Support Methods (DSM) should be implemented to govern priority scales as well as strategic directions on concrete actions. Here, the discussions on future alternatives and priorities within multi-stakeholder groups, through simple-attributes-rating-technique, are the most promising approach in driving the effectiveness of program preparation.

In between the interaction problems between private companies and local people, government delivers its role through regulations such as on law enforcement, policies (using participatory mechanisms), and land certification to intervene the interaction patterns of companies and local people.

Conclusion

This review tries to synchroniserecentstudies of interaction among stakeholders in forest governance. It reveals the findings of the roles of government, private companies, and local inhabitants in Indonesian forest governance. The findings indicate there are interactions on the activities of the stakeholders in forest use. As such, this study would like to recommend future researchers to investigate the forms of government interventions which probably effective in handling interactions between companies and local people. This study suggests that one way to further the investigation is to deliver experiment and game theory concerning the interaction of the three stakeholders.

This study also suggest that a wide evaluation on the stakeholders' interaction may deliver benefits. As such, future research could implement a quantitative survey concerning the model of stakeholders' interplays in forest management. The survey could validate the findings of experiment and game theory of stakeholders' interaction. Here, a survey across Indonesia may be of benefit.

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