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## **PEAT FIRE ECONOMY AND ACTOR NETWORK IN SUMATRA: AN ANALYTICAL APPROACH**

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### **SUMMARY**

Peat fires have become a local, national and global concern. The health issues and economic disruption caused by haze from peat fires have been enormous. Estimated economic losses from fires in 2015 were in excess of USD 16 billion. This paper focuses on the political economy of forest and land fires in Riau. It highlights how fires break out, the actors involved, rent seeking activities, and the social networks associated with forest and land fires. It identifies the actors involved through surveys and value chain analyses, while their roles and relationships with other actors are analyzed using social network analyses. We found that some actors obtained enormous benefit from fires. The economic power is the determining factor in how these actors influence decision-making processes and their implementation to work in their own interests through their network patronage.

**Keywords:** *peat, fire, actor, economy, network*

### **BACKGROUND**

The health issues and economic disruption caused by haze from forest and land fires have been enormous. In 2015 the cost of fire and haze was estimated USD16 billion (The World Bank 2015). In 2012, forest fires in Riau released 1.5 to 2 billion tonnes of carbon emissions in a week - equivalent to 10 percent of Indonesia's total annual emissions (Moss 2015). Singapore and Malaysia complained about trans-boundary haze from Indonesia causing disruptions to tourism, health and the economy.

The Indonesian government has tried to overcome the problem of forest and land fires. The President committed to stop Indonesia producing haze from forest and land fires in 2015. Can this commitment be achieved? How can the Ministry of Environment and Forestry, local governments, the business community and civil society organizations create a quick and accurate response to overcome forest and land fires? This paper focuses on the political economy of forest and land fires in Riau as input for our collaboration to overcome them. It highlights how fires break out, the actors involved, rent seeking activities, and the social networks associated with forest and land fires.

### **POLITICAL ECONOMY ANALYSIS AND METHODS**

Political economy is generally defined as a study that views politics as a crucial factor in determining economic outcomes (Drazen 2000). Forest and land fire-related projects have long been carried out in various provinces in Indonesia, with and without bilateral cooperation, and a number of technical, economic, social and political recommendations have been generated (Dennis 2009). The failure to understand the political economy (Dauvergne 2009) of actors and patronage have often resulted in failed attempts to resolve the problem of forest and land fires (Varkkey 2013). Key patrons in forest fires comprise businesses and political ruling elites at the local, national and global levels. Incongruence between the causes of fires and proposed management solutions occurs in countries all over the world. In Indonesia and Brazil the underlying cause of fires is social-political problems, whereas action plans prioritize technical research into firefighting. This hampers efforts to overcome the problem of forest and land fires (Carmenta 2011).

Value chains analyses were used to understand how added value and benefits are distributed between each actor along production and marketing value chains. Per actor added value can be calculated using benefit and cost analyses. The roles of actors in forest fire occurrences can be determined independently, or based on their relationships with other actors. Each actor has a particular role to play, and is not necessarily reliant on its relationship to others (Borgatti 2013). The roles of actors in the context of how they are related and connected to

other key actors were analyzed using a Social Network Analysis (SNA). Actors may be highly capable of analysis or might be practitioners, but if they are disconnected or isolated from a network, they have no significant role. Rent seekers often sit in important positions in networks; another underlying problem causing land and forest fires.

## FIRE ECONOMY

Cleared land (cut and slashed) was worth USD 665/ha and sold in the form of two-hectare blocks. Added value for land consisted of the following: 26% for farmer groups in the land clearing phase; 4% gained by claimers for their efforts in claiming the land; 6% of the total value of the land for marketing, including travel, communications and other costs; and 13% of the total value of the land gained by village officials for land administration documents; with the organizers of farmers groups gaining the highest value at 51%. Based on information on the ground, there were no clear patterns for benefit sharing between farmer group organizers and other organizers. However, the organizers of farmers groups usually gained more benefits than any others. When buyers bought only cleared (cut and slashed) land, they would be responsible for land preparation. They might burn it or use mechanized tools to prepare the land. The marginal cost for land preparation would benefit the buyers. Higher values were obtained from *'ready-to-plant'* land, which had already been slashed and burned. Local people call this mode of trading *'terima abu'* (receiving the ashes). The distribution of benefits for actors involved in *'terima abu'* is shown in Figure 1. The trading value was USD 856/ha. Farmer group organizers promised their members would gain parts of the land for free or at a reduced price. This cost about 0.2% of the total value. The farmer group organizers gained 57% of the total value or around USD 486 per hectare.

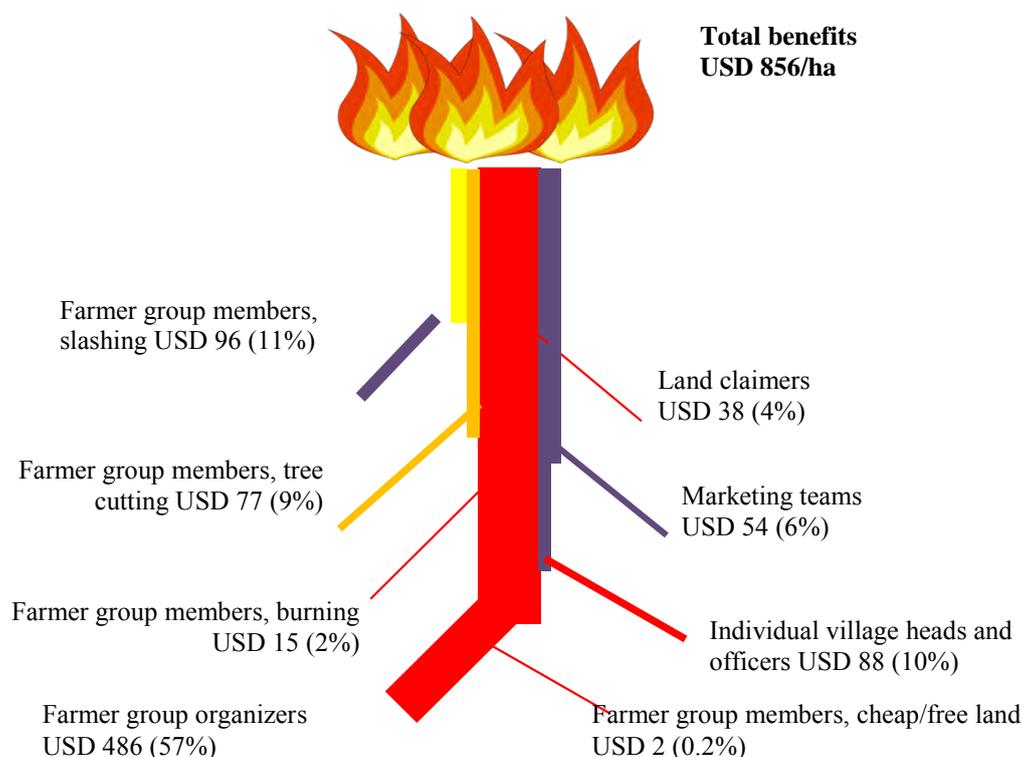


Figure 1: Added value for *'ready-to-plant'* land per hectare

*'Ready-to-plant'* land was not only sought by palm oil investors but also by small-scale investors for horticultural purposes. It was easier for small-medium investors to buy *'ready-to-plant'* land due to its lower price and its flexibility in managing growing costs. Other investors, preferring to choose more practical means and quicker profits, were willing to pay USD 3077 /ha for ready-to-harvest oil palm plantation land. Around USD 992 or 32% of the total value was allocated for planting and growing costs for 3-4 years. Laborers received around 7% and 5% of the total value respectively for land clearing and planting. Benefits gained by individual village heads and sub-district officials amounted to 3% of the total value. Land block letter or *'certificate'* holders would only gain 1% of the total value, an extremely small amount for those not involved in group management. Farmer group organizers carried out management, administration and marketing processes and gained the largest share at 51% of the total value.

## ACTOR NETWORK

Stakeholders in forest fires are related to one another in various contexts, i.e. information exchange, economic transactions, kinship, political affiliation, ethnicity or religion. Each of these relations can be independent or mutually reinforcing. Centrality determines the importance of actors in the network, which is measured by degrees of connectivity and betweenness. The degree of centrality measures the quantity of relations, such as information received or sent out from each node or actor, while betweenness measures an actor's role as the shortest path (geodesic link) between two other actors.

Degrees for centrality in land transaction and fire information networks are shown in Figure 2. Higher degrees are indicated by larger circles. There are four actors having high degrees of connectivity, namely: village governments, sub-district governments, district governments and advocacy groups. Connectivity is the amount of received information (in-degree) or outgoing information (out-degree). The lowest degree belongs to farmer group members, which indicates they are the most isolated actors in forest fire information traffic.

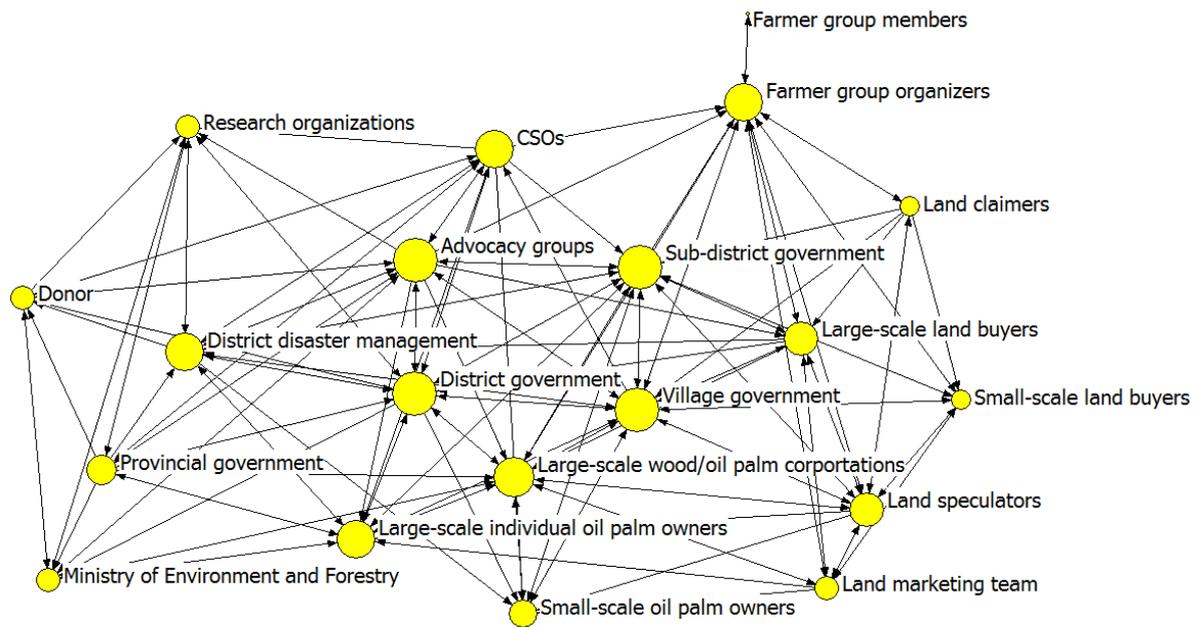


Figure 2: Centrality information network for land transaction and fire stakeholders

The crucial roles of actors in linking information between other actors are shown in Figure 3. Larger circles indicate a greater role in becoming information hubs between actors in land transactions and fires. Farmer group organizers and advocacy groups are the two most important actors in linking with other actors. Farmer group organizers became central hubs for other actors in land transactions connected to fires. Figure 5 shows groups of actors based on their *Euclidean* distances, The Euclidean distance between two stakeholders is equal to the square root of the sum of the squared differences between them.

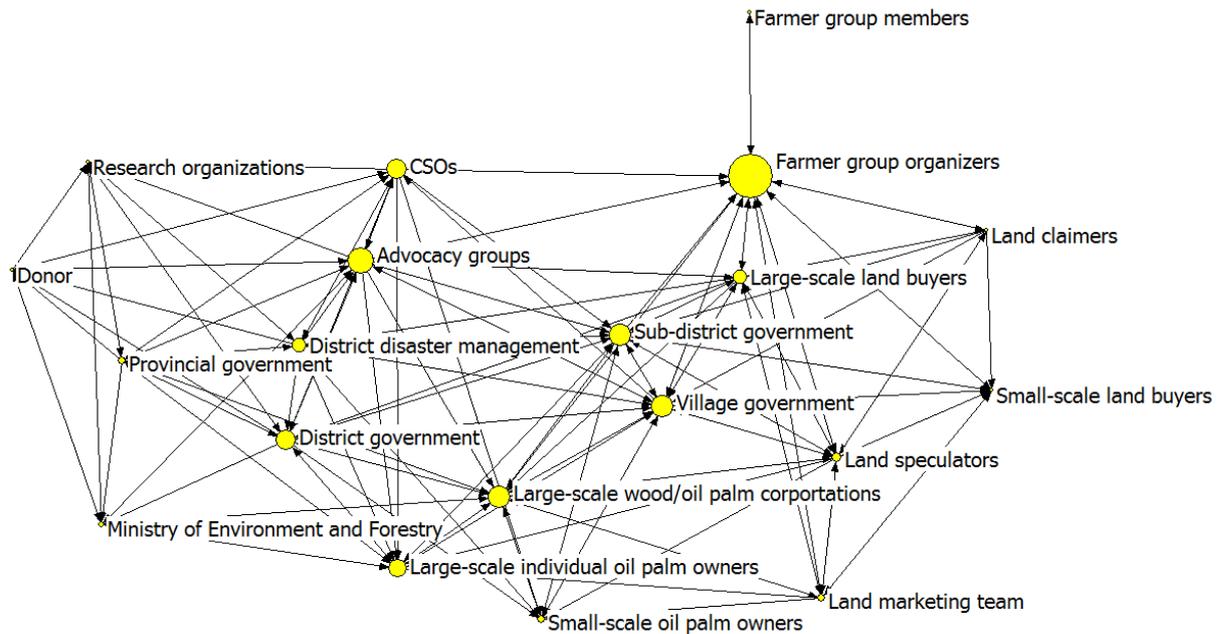


Figure 3: Betweenness information network for land transaction and fire stakeholders

## DISCUSSION

The large amounts of economic rent involved bring negative impacts for natural resource development. There are illegal aspects to the accumulation and pursuit of economic rent. The burned areas are land and a state forest area, the use of which is regulated by brings about losses for society and the majority of people. The economic rent surrounding fires will be legal when they occur only on privately owned land and are supported by law. A zero burning policy is advocated by many stakeholders, while others doubt it is possible (Tacconi *et al.*, 2008). In some parts of Indonesia, traditional, limited and controlled burning remains an integral part of land clearing law. Land claims occurring in the lead up to forest fires are often carried out illegally. Illegal economic rent is a livelihood source for some sections of communities as well as people at the local and national levels.

The magnitude and amounts of economic rent involved indicate that fires generate huge earnings for certain people, particularly for elites ruling farmer groups for their contributions in land clearing, and for oil palm investors for their contribution in developing areas in the aftermath of fires. Putting a stop to forest and land fires will mean ending the economic rent for such people. Legality, economic and social approaches are crucial in order for this to happen. The legality approach alone is not enough for tackling forest and land fires. The distribution of economic rent also shows actors interested in policy development and the implementation of fires. Actors who benefit from fires will have net incentives for them to continue. As long as fires create more economic value than REDD+ or PES, then those actors will not feel incentivized to overcome or tackle fires.

Policy interventions should focus on central actors in land transaction and fire information networks, namely local governments (village, sub-district and district) and advocacy groups. The information networks position them as the most important actors playing roles in preventing and overcoming fires. Elites ruling farmer groups are the most important actors in linking whole networks. At the same time, these ruling elites are also the biggest recipients of economic rent from land clearing for oil palm plantations. In other words, in order to create effective efforts for preventing and overcoming forest and land fires we must start from the network core that involves these ruling elites.

## ACKNOWLEDGEMENT

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