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Title: Causes of Southeast Asian forest fires: a multi-scalar analysis

The economic costs of Indonesia’s 2015 forest fires are estimated to exceed US $16 billion, with more than 100,000 premature deaths. On several days the fires emitted more than the entire United States economy. To the best of our knowledge, there is limited work blending modern quantitative social science empirical techniques with remote-sensing data, particularly in the important context of Indonesia’s fires.

Here we assess the underlying anthropogenic causes of forest fires in Indonesian jurisdictions at district and village scales. Combining detailed geospatial information on fire and local climatic conditions with district-level information on government decentralization and economic growth, we leverage a rare natural experiment in and the longitudinal features of our data to disentangle time-varying common factors and fixed spatial determinants from local political and economic changes.

Our study finds that political decentralization increased fire and exacerbated the fire impacts of El Nino. Village-level decentralization may thus present an imminent fire threat. Local economic growth, particularly rural decentralization, has also gone hand-in-hand the use of fire in rural districts. We proceed with a 30,000-village case study of the catastrophic 2015 fire season on Sumatra and Kalimantan. We find that villages more likely to burn tended to be less developed, more remote, exposed to palm oil supply chains, and have a history of burning for agriculture. The close link between poverty and fires at the village level suggests that the current policy push for village development—if successful—could potentially reduce fire. Central and district level policies have contributed to voracious environmental degradation, but the strengthening of the village as an administrative and developmental unit could offer opportunities to reverse this trend.

Our study contributes to development, economics, and environmental literature, cutting across many of the conference themes but “Development and Climate Change” in particular.