Dragon Capital Chair

REPORT

ADDITIONALITY OF OVERLAPPING POLICIES

Photograph: Joshua Woroniecki, Unsplash

We examine whether the spatiotemporal layering of conservation policy reduces deforestation more effectively than single protections, and whether such effects depend on exposure to expanding agricultural pressure. The focus on Indonesia -- a major carbon sink and biodiversity hotspot as well as the global leader in palm oil production -- allows us to investigate the relationship between environmental protection and economic development when both incentive structures bind.

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Additionality of Overlapping Policies

Research and policy question

We examine whether the spatiotemporal layering of conservation policy reduces deforestation more effectively than single protections, and whether such effects depend on exposure to expanding agricultural pressure. The focus on Indonesia -- a major carbon sink and biodiversity hotspot as well as the global leader in palm oil production -- allows us to investigate the relationship between environmental protection and economic development when both incentive structures bind. We thus quantify the dynamic additionality of multiple conservation instruments, before analysing the optimal sequencing of policy layering under development stress.

Methodological approach

Through archival research, we assemble a novel, spatially explicit dataset of Indonesian land-use classifications, protected area designations, and palm oil mills construction between 1919 and 2023. We combine this with high-resolution satellite data on forest cover change between 1990 and 2023, comprising deforestation, forest degradation, undisturbed primary forest and palm oil plantations. We identify causal impacts leveraging the staggered rollout of protected areas and palm oil processing mills. Since oil palm cultivation is only feasible within a limited radius of an operating mill, openings create sharp increases in local deforestation incentives that are plausibly exogenous to conservation policy placement. We estimate treatment effects using dynamic difference-in-differences and triple-difference designs, comparing forest outcomes before and after policy rollout, and before and after exposure to palm oil expansion. This allows us to assess whether conservation policies are effective under economic pressure, and whether overlapping protections provide additional benefits beyond single designations.

Figure 1: Overlapping conservation policies in Indonesia

Findings

We find that conservation policies significantly and persistently reduce forest clearing and degradation under agricultural expansion, but that protection is permeable rather than absolute. Moreover, areas with longer-tenured instruments show stronger forest retention. Overall, our results indicate that conservation policy exhibits meaningful additionality under development

pressure, but that layering alone is not sufficient to fully offset economic incentives for land conversion.

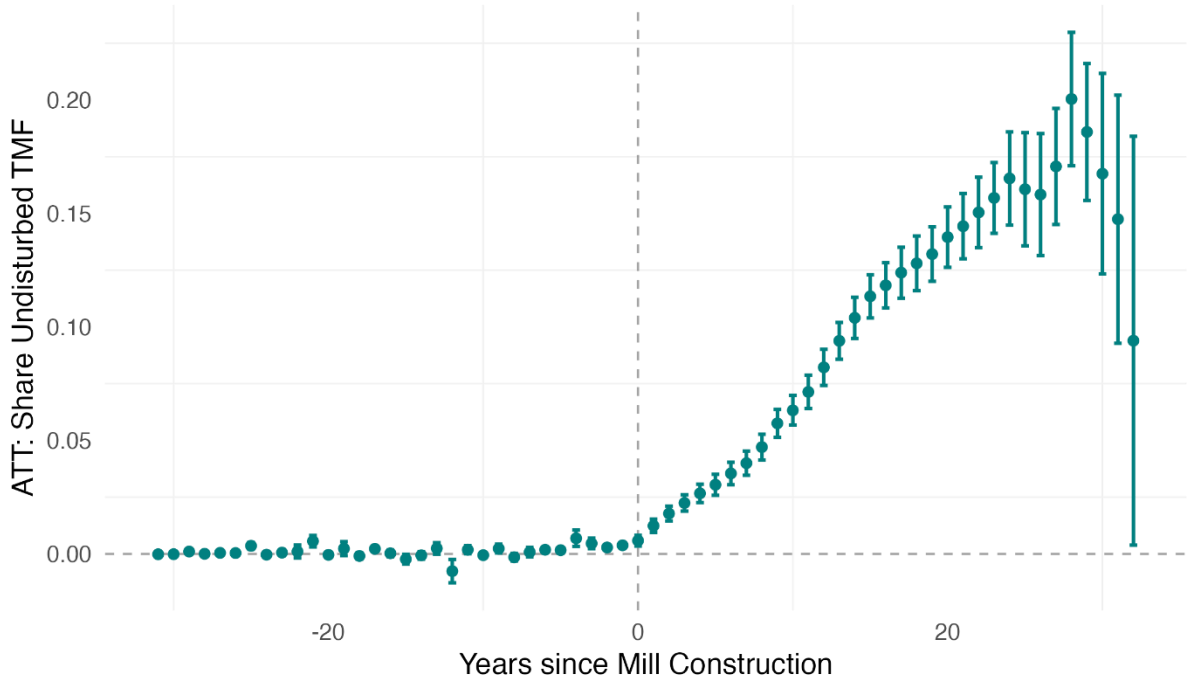

***Figure 2**: Average treatment effects on the treated from triple-difference regression*

Additionality, dynamics and placement

By empirically characterising the relationship between economic development and biodiversity conservation, we identify policy additionality spatially and dynamically. Forest protection generates substantial and persistent environmental benefits once the agricultural frontier reaches a pristine environment. This implies that ex ante evaluations based on baseline deforestation rates may systematically underestimate future policy relevance, while quantifying deforestation risk and trajectories is of the utmost importance.

Policy implications

These results suggest that conservation policy should prioritise areas facing imminent deforestation risk rather than low-pressure locations. Furthermore, our findings caution against relying solely on area-based designations without considering economic context. Conservation effectiveness depends critically on anticipating development pressures and balancing protection with economic potential. Targeting protection strategically, ahead of agricultural expansion, is essential in order to maximise additionality and achieve climate and biodiversity objectives.

Silici, L, Groom B and Palmer C (2026). Additionality of Overlapping Policy. *Mimeo* LSE.

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