

Geo-spatial impact assessment of financing area-based conservation

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Uncertainty about the effectiveness of area-based conservation is a major challenge to secure financing of protected areas. KfW's transparent and replicable geo-spatial impact approach demonstrates that the financing of protected areas does effectively reduce forest cover loss.



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The challenge to monitor forest cover loss

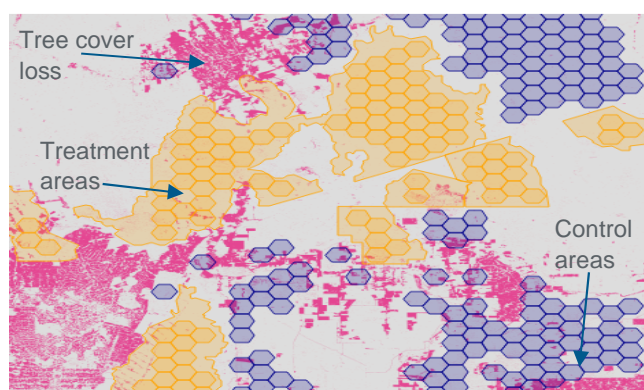
Monitoring data on forest cover loss may be misleading in assessing protected areas' (PA) effectiveness, because forest cover may decline even in PAs. Such doubt reduces the trust and financing of conservation measures and undermines efforts to reduce forest cover loss and CO₂ emissions.

A geo-spatial approach for impact assessment

As one of the largest development partners working to maintain biodiversity worldwide, KfW Development Bank developed a framework integrating development finance project information with open-source geo-data on forest cover loss to quantify PAs' effectiveness. The scientific method proceeds in three steps:

1) Access and assemble project and open-source data

About 400 financed PAs (~95 mil. Ha or the area of Pakistan) are linked to zones in the [World Database on Protected Areas](#). KfW's [MapMe Biodiversity R package](#) facilitates the identification and download of all necessary geo-spatial data to perform the impact assessment.



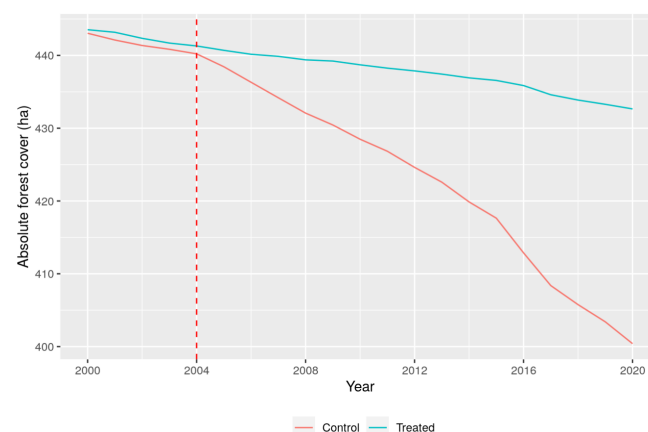
An example of the PAs that could be used for an impact assessment of the effectiveness of PAs on reducing forest cover loss. Source: KfW.

2) Perform statistical analysis

The challenge: comparing PAs with a control group of non-protected areas is subject to selection bias; for instance, PAs tend to be located in more remote areas. **The solution:** KfW's analysis framework ensures an apples-to-apples comparison by finding a "statistical twin" through an elaborate yet transparent matching procedure. For instance, the matching procedure aligns non-protected and protected areas only if they exhibit a similar travel distance to the nearest settlement.

3) Communicate PA effectiveness

The engagement of KfW and its partners, on average, effectively contribute to reducing forest cover loss in PAs compared to similar non-PAs. The graph shows that, initially, the respective forest cover in PAs and control areas is similar, in addition to a similar down-ward trend until the project's start year. After project start, control areas have a stronger rate of forest cover loss than PAs. The gap between the two trend lines measures the conservation impact of financing the PA.



An example project: Forest cover loss over time in PA areas with development finance ("Treated") vs. comparable non-PA forest areas ("Control"). The red dashed line is the year when development finance was disbursed. Before disbursement, treatment and control areas have a similar downward trend in forest cover. After disbursement, control areas' forest cover decreases more strongly, and the rate of forest cover loss increases while relatively less forest cover is lost in treatment areas. Source KfW.

Given the statistical assumptions, the financed projects overall contributed to 3-8% of the PA's area in avoided forest cover loss. The average effect is estimated to be roughly 5.7 mil. ha (the area of 8 mil. soccer fields or the area of Togo) in avoided forest cover loss for KfW's engagement in Latin America and the Caribbean.

Next steps

KfW's evaluation department mainstreams this analysis for its project portfolio. Moreover, classifying the project interventions by IUCN action types will be crucial to formulate detailed lessons learnt on "what works" in area-based conservation. This framework serves as an evidence and communication tool that financing measures in PAs is effective to conserve forests.