

Human population, roads reduce effectiveness of protected areas

Designated protected areas such as wildlife parks and sanctuaries are effective at preventing forest loss — except when there are roads or more populous areas nearby, find scientists.

Loss of forests is a worry in most tropical countries including India which is home to the Western Ghats, one of the world's major biodiversity hotspots. To assess trends of forest loss in the Ghats, a team including Meghna Agarwala from Ashoka University, analysed high-resolution Landsat satellite imagery from 2000 to 2016. The team examined whether the forest loss correlates with factors including protection status of an area (protected area PA, versus non-PA) and proximity to roads and towns. They collected biophysical (slope, elevation etc, which play a role in patterns of forest loss), demographic (human population densities from census data) and administrative (protection status of an area) data from multiple sources, incorporating this into their spatial analysis.

The results, published in *Biological Conservation*, show that forest loss — though confined to only small patches — is higher in wetter areas, higher altitudes and near rivers and lakes across 89,681 sqkm of forests in the Ghats. Protected areas were 30% less likely to lose forest than non-protected areas, especially when forests were closer to roads and towns. However, the advantage of protection declined by 32% when local population densities increased.

“Interestingly, we found that the benefits of protection can be modulated by how close a forest area lies to a road or how dense the surrounding human populations are,” writes co-lead author Meghna Krishnadas of Yale University, U.S., in an email to *The Hindu*. “In the case of roads and protection, we found that protection reduced forest loss, but the benefit of protection diminished if the forest patch was within 4 km of a road.”

However, the results varied when the team analysed two smaller landscapes in Karnataka, hinting that local factors are important mediators of forest loss patterns. This could include how locals use forests in their vicinity and working with communities could improve long-term forest conservation, adds Ms. Krishnadas. “Larger studies like these can help scientists explore local degradation near roads,” says scientist P. Jeganathan of the Nature Conservation Foundation who was not part of the study but has studied wildlife roadkills in the Ghats. “It would have been interesting to explore how other linear infrastructure — like powerlines or canals — also impact forest loss. Translating this into policy would be crucial,” he adds.

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