A World of Opportunity

Over the last several centuries, most forest areas have been cleared as agriculture has spread and human populations have grown. About 30 percent of global forest cover has been removed and 20 percent is currently being degraded. Brawling the spin of loss and degradation and restoring those lands would bring many benefits.

Restored lands support livelihoods and biodiversity by supplying clean water, reducing erosion, providing habitat for birds, and other forest products. For example, trees mitigate climate change by sequestering carbon. Trees in agricultural landscapes can enhance soil fertility, conserve soil moisture, and boost food production.

More than two billion hectares worldwide offer opportunities for restoration—a area larger than South America. Most of these lands are in tropical and temperate areas.

- One and a half billion hectares would be best-suited for mosaic restoration, in which forests and trees are composted with other land uses, including agriculture, smallholder and subsistence agriculture, and settlements.
- Up to about half a billion hectares would be suitable for wide-scale restoration of closed forests.
- In addition to these two billion hectares, there are 200 million hectares of unproductive lands, mainly in the far northern boreal forests, that have been degraded by fire. These areas would likely be difficult to restore due to their remoteness.

Croplands and densely populated rural areas on former forest lands amount to a further one billion hectares. These do not offer extensive restoration opportunities in terms of area, but some of these lands would benefit from having trees planted in strategic places to protect and enhance agricultural productivity and other ecosystem functions.

The results must be interpreted with caution. Vast deforested areas in Europe and North America, which may offer opportunities for restoration—an area larger than the world's current forested lands—were not included. Only the potential extent of forest and woodland areas in areas currently without human influence (top map, right). Dry areas were also identified.

For example, we first mapped where forests and woodlands were located, which were identified as areas where at least 15 percent of the area was covered by vegetation. We then refined the analysis to identify areas where the potential extent of forest and woodland areas could grow according to climatic conditions—their potential extent (published in 2009 and revised in 2010). The boreal forest landscapes of the north are now included; differences in forest cover are reflected in greater detail; the assessment of potential forest cover has been improved; and the analysis has been updated with more recent and higher resolution data. The new map indicates a restoration opportunity of 32 percent of the area. This very large scale is mainly because a more precise mapping of potential forest extent has increased the estimates of degraded lands with opportunities for restoration, not because something has changed in the real world.

Methods — We first mapped where forests and woodlands could grow according to climatic conditions—their potential extent without human influence (top map, right). Dry areas such as the Sahara were not included, although these play an important role there, because of their very low potential forest density. Second, we mapped the current extent of forests and woodlands (bottom map, right). Forest maps were derived from global 250m resolution satellite imagery. Third, we identified restoration opportunities by comparing the ratio of potential and current forest extent in each country. This ratio of natural forest and managed natural forests and woodlands were considered to have no need or potential for restoration.
A World of Opportunity for Forest and Landscape Restoration

Wide-scale restoration is possible in less populated areas with low intensive land uses where closed forests can grow back on a large scale once barriers such as fire or grazing are controlled.

Mosaic restoration is suitable where the population density is higher, including on lands where closed forests cannot grow. The result is a mix of forests, trees, and other land uses including agroforestry and small-holders agriculture.

Remote restoration opportunities exist in unpopulated areas, but are so far from human habitation that restoration may not be feasible. In these areas, forests have been lost or degraded by natural and human-influenced forces such as fire, drought, extreme climatic events, or pests and disease.

Cropped and settled areas on former forest lands may benefit from tree planting on steep slopes, along waterways, and in other targeted places to prevent soil erosion, protect waterways, absorb storm water, increase soil fertility, and enhance soil moisture capacity.

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- Up to about half a billion hectares are suitable for wide-scale forest restoration of closed forests.
- In addition to these two billion hectares, there are 200 million hectares of unpopulated lands, mainly in the far northern boreal forests, that have been degraded by fire. These areas would likely be difficult to restore due to their remoteness.

Cropped lands and settled areas on former forest lands amount to a further one billion hectares, but do not offer significant restoration potential. Some of these lands could benefit from having trees planted in strategic places to protect and enhance agricultural productivity and other ecosystem functions.

More information may be found at www.ideastransformlandscapes.org and www.wri.org/restoring-forests.