

Model Forests and Climate Change



Climate change is an existential threat to nature and society. As climate shocks intensify and the impacts of anthropogenically-induced global warming become increasingly damaging to people and ecosystems, there is an urgent need to promote adaptation and mitigation while simultaneously ensuring biodiversity, ecosystem services, and socioeconomic co-benefits. Model Forests provide valuable lessons and replicable models, balancing forest conservation and human needs while acting as Nature-based Climate Solutions.

What is the Issue?

Since the advent of industrialisation, mean global temperatures have risen an astounding 1°C (IUCN, 2019). This temperature rise has created tremendous changes to our planet, from rising sea levels and worsening natural disasters to species extinction and economic loss. Current forecasts predict that the world remains at risk of exceeding the 1.5°C limit set by the Paris Agreement, creating an urgent need for proven solutions (UNEP, 2025).

Forest ecosystems are some of the most important in addressing climate change. Annually, approximately 2.6 billion tonnes of carbon dioxide (or one-third of the total CO₂ released from burning fossil fuels) is absorbed by forests (IUCN, 2021a). However, we are witnessing the rapid loss of these ecosystems, with over half of our planet's tropical forests having been destroyed since 1960 (IUCN, 2021b). With every hectare lost, not only do we lose important carbon sinks and climate regulators, but we contribute to climate change.

Around 5-10 gigatonnes of CO₂ annually is released because of deforestation and forest degradation (IUCN, 2021a). In total, forest loss is responsible for around 25% of our global carbon emissions (IUCN, 2021a). Increasing and maintaining forest cover and integrity is therefore an essential component in the fight against climate change.

Why is this Important?

There is no solution to climate change and terrestrial biodiversity loss that does not involve healthy forest ecosystems. Forests play a tremendous role in the fight against climate change for several key reasons.

1. As one of the largest carbon sinks on our planet, their survival plays a critical role in reaching targets like Sustainable Development Goal 13 (Climate Action) and the 1.5°C limit under the Paris Agreement.

In fact, promoting forest conservation and restoration plays a role in nearly one-third of the total climate change mitigation measures scientists have mapped out to reach the 2030 objectives of the Paris Agreement (IUCN, 2021a).

2. Unchecked forest loss is creating a positive feedback loop that amplifies the effects of climate change. Climate change is a leading cause of forest degradation, with numerous species succumbing to climate change provoked natural disasters and diseases every year. Deforestation leads to the loss of carbon sinks that sequester greenhouse gases like carbon dioxide. This further worsens the effects of climate change, creating a cycle of forest loss and climate disruption.

3. Forests are crucial to the well-being of people and countless species. Globally, 1.6 billion people—nearly 25% of the world's population—rely on forests for their livelihoods, with more than 240 million people calling forests home (IUCN, 2012). Forests contribute more than 1.52 trillion USD a year to national economies (FAO, 2022). Additionally, they are home to 80% of the world's terrestrial biodiversity (IUCN, 2021a) and act as buffers against zoonotic disease (Morand and Lajaunie, 2021).

What Can Be Done?

IUCN and the International Model Forest Network (IMFN) are working together to advance climate solutions rooted in community-based forest management approaches. Together, IUCN, IMFN, and partners are working towards a vision for sustainable, long-term forest management strategies that combat climate change while conserving biodiversity, providing socioeconomic benefits to local communities, and advancing gender equality.

The IMFN is a voluntary global community of practice whose members and supporters work toward the sustainable management of forest-based landscapes and natural resources through the Model Forest approach.

A Model Forest is a fully working landscape of forests, farms, protected areas, rivers and towns that combines the social, environmental, and economic means of local communities with long term sustainability to conserve forest landscapes. Through commitment to six core sustainability principles, these community-managed landscapes are unique in their ability to test and incubate new approaches to climate change adaptation and mitigation. Using activities like targeted ecosystem restoration, assisted natural regeneration, and climate resilient value chain creation, Model Forests are proving the power of stakeholder collaboration—across local, regional, and global scales—to support communities in adapting to climate change while contributing to country commitments, including Nationally Determined Contributions (NDCs) under the Paris Agreement.



Model Forests have successfully adopted Nature-based Solutions for climate in the following ways:

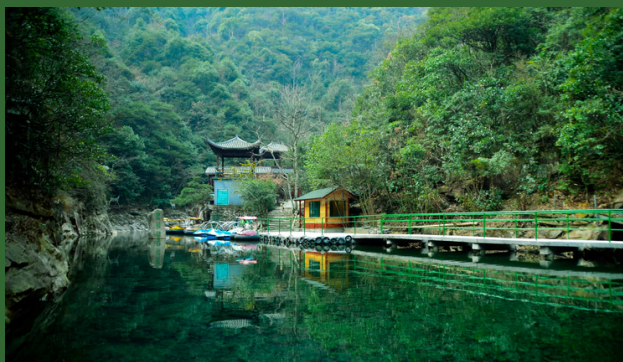
- Designing and scaling up leadership platforms that promote climate resilient entrepreneurship, green enterprises, and Nature-Positive value chains.
- Promoting knowledge sharing and education surrounding sustainable resource management strategies, including Forest Landscape Restoration (FLR), to enhance community capacity to halt and reverse deforestation and forest degradation.
- Creating forums for local stakeholders to define sustainable governance on their own terms and supporting national and sub-national decision makers in reaching climate change goals.
- Facilitating place-based investment in FLR and conservation strategies that enhance ecosystem integrity and functionality, supporting climate adaptation and mitigation at the local level.

As countries, communities, civil society, and the private sector work to address climate change, it is essential to carry forward these lessons from Model Forests, translating them across contexts and scales. By encouraging uptake of the Nature-based Climate Solutions already driving change in Model Forests, the global community will be better equipped to combat climate change and its effects.

Case Study: China's Lin'an Model Forest

Approximately 261,900 hectares, or 83%, of the land in China's Lin'an County is forested (IUCN, 2024). In the 1980s, this timber-dependent county faced hardship due to a loss of livelihoods as a consequence of deforestation. However, since joining the IMFN in 1999, the forest, and those who rely upon it, have made brilliant recoveries through the promotion of sustainable forest management and research.

Most notably, Lin'an Model Forest has developed diverse climate change adaptation and mitigation methods. These include the introduction of non-timber forest product (NTFP) production and marketing opportunities, the cultivation of understory crops, and the establishment of research projects focused on measuring carbon storage and emissions. For example, the Zhejiang Agriculture and Forestry College, a Model Forest partner, constructed China's first carbon flux towers to measure carbon absorption and emissions in Lin'an county. In addition, a local research facility in the Model Forest studies the effects of climate change on bamboo growth and production, which is critical to ensuring long-term supply chain sustainability and boosting climate-adapted innovations.



Resources

FAO (2022). [The State of the World's Forests in 2022](#).
IUCN (2012). [FOREST PEOPLES: Numbers across the world](#).
IUCN (2021a). [Issue Brief: Forests and Climate Change](#).
IUCN (2021b). [Issue Brief: Deforestation and Forest Degradation](#).
IUCN (2024). [IUCN Model Forests Around the World: China](#).
Morand S. and Lajaunie C. (2021). [Outbreaks of vector-borne and zoonotic diseases are associated with changes in forest cover and oil palm expansion at global scale](#). *Frontiers in Veterinary Science*, 8.
UNEP (2025). [Emissions Gap Report 2025](#).

To learn more about IUCN and Model Forests:
[International Model Forest Network](#)

[IUCN Forest Programme](#)

[Lin'an Model Forest Video](#): Reviving China's Forest through Sustainable Bamboo and Hickory

[Lin'an Model Forest](#): Social media increases interest and income in sustainable forestry in Lin'an, China

Photo Credit:

International Union for the Conservation of Nature and the Bureau of Agriculture and Rural Affairs of Hangzhou Lin'an District

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