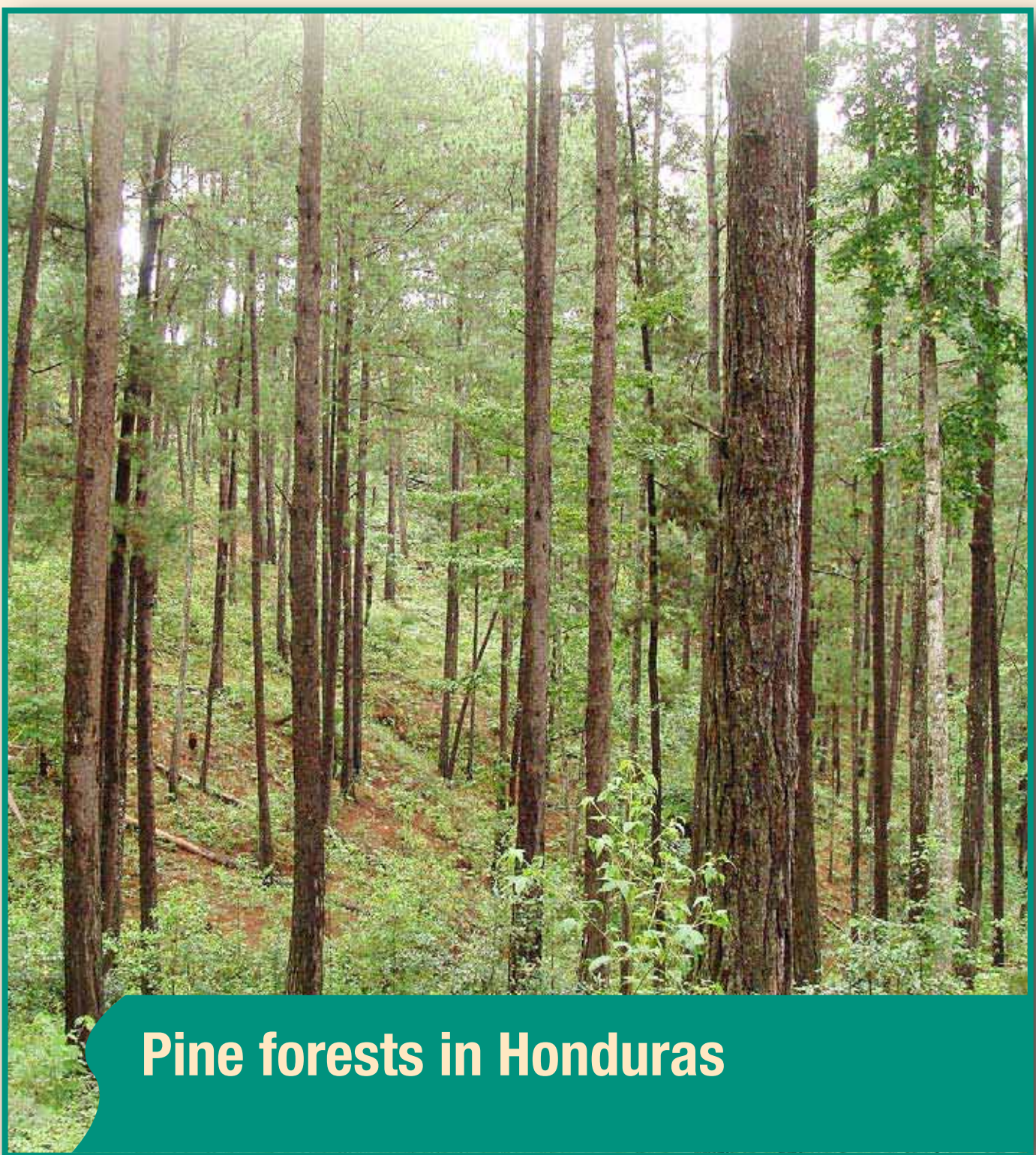


# Tropical forests are important for adaptation to climate change in Central America

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Pine forests in Honduras

## Introduction

**Forests provide vital ecosystem services to humanity and are vulnerable to climate change.** For these reasons, forests should be considered in adaptation strategies and policies, especially because of their role for increasing the adaptive capacity of relevant socioeconomic sectors in developing countries.

The Trofcca project (Tropical Forests and Climate Change Adaptation) is an initiative implemented by **CIFOR in Indonesia and West Africa (Burkina Faso, Mali and Ghana)** and by CATIE in Central America (**Costa Rica, Honduras and Nicaragua**). The project is developing methodologies and tools to integrate forest ecosystems into regional and national adaptation policies.

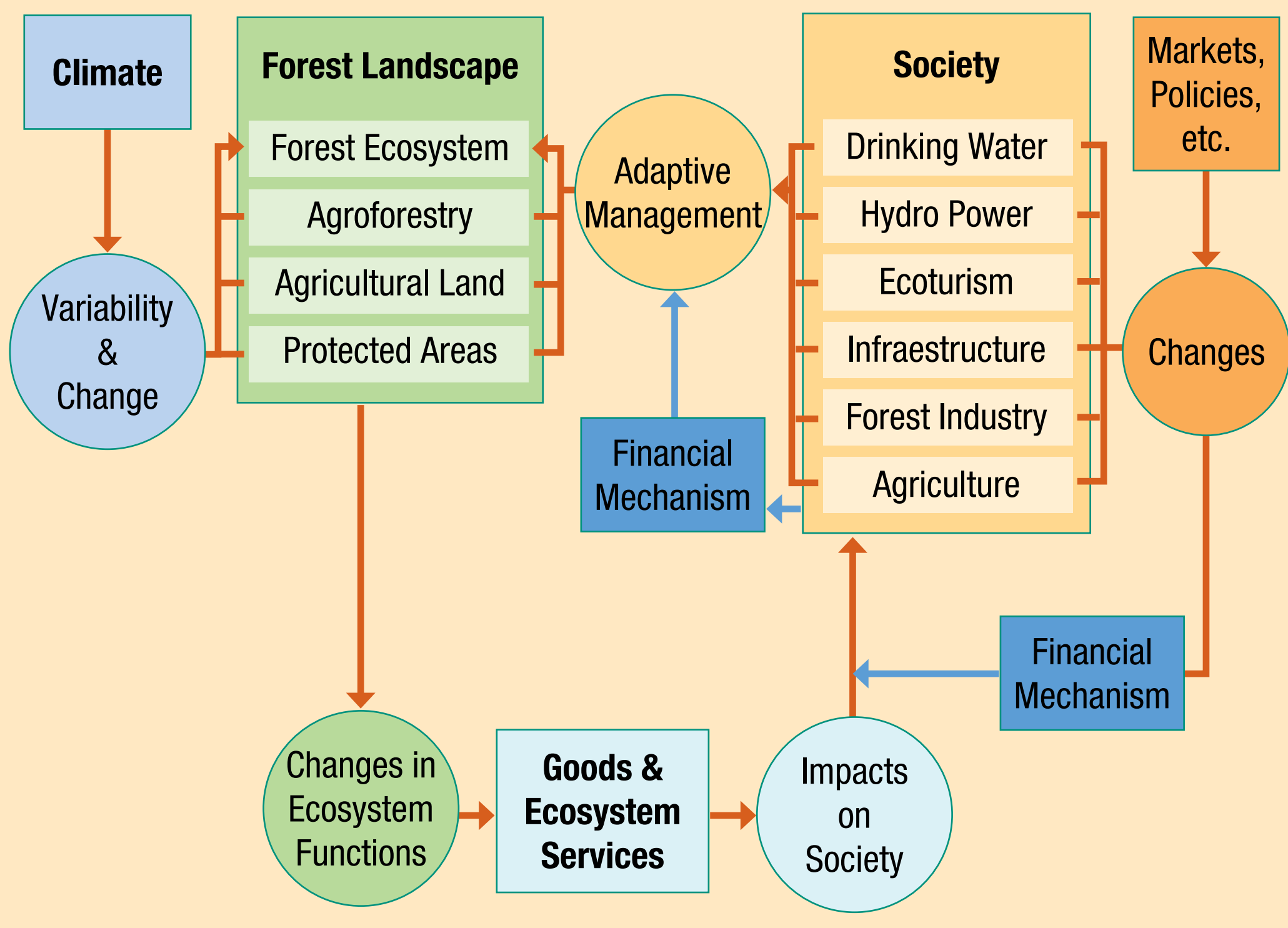
## Objectives

Trofcca aims at integrating forests into adaptation policies and development plans. The project interacts with local, national and regional stakeholders to raise awareness and design strategies on the role of tropical forests in adaptation to climate change. Trofcca studies the vulnerability of forests and their ecosystem services, the consequences of this vulnerability to society and appropriate adaptation strategies. In addition, it analyzes policy-making processes related to ecosystem services and climate change and will contribute to the National Communication annexes of the UNFCCC.

## Conceptual Framework

From a simple forest-for-forest approach, the project evolved to use of an integrated approach that can be defined as a forest-for-society focus. The latter aim to connect the decisions made by society with the sound evaluation of goods and services provided by forest ecosystems. The vulnerability of ecosystem functions, goods and services to climate change will have an impact on the well-being of society. Therefore, society should participate in the design and implementation of adaptive management strategies for forest landscapes. The approach also considers the design and implementation of appropriate financial mechanisms to cover the costs of adaptive management.

Integrated approach proposed by the project Tropical Forests and Climate Change Adaptation in Central America



## Regional Priorities

Because Trofcca focuses on the links between forests and the vulnerability of society, development-relevant socioeconomic sectors dependent on ecosystem services were identified during a regional workshop with stakeholders held in April 2006. **In Costa Rica, Nicaragua and Honduras, hydroelectric power and drinking water were selected;** in Costa Rica, ecotourism was also selected. These sectors were considered priorities for national development, highly dependent on ecosystem services and vulnerable to climate change.



## Integrated approach

Trofcca is structured in the following research themes:

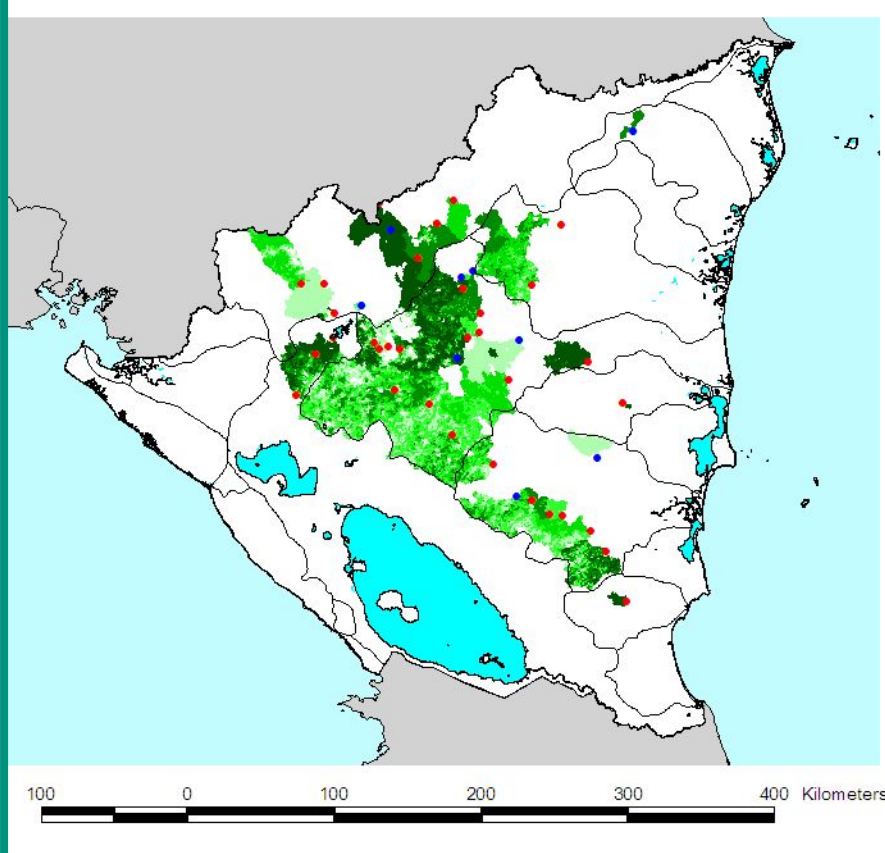
**Theme 1: Identification of forest ecosystems providing services that could reduce society's vulnerability. A model to determine hotspots of ecosystem services for specific socioeconomic sectors was developed.** The model combines geospatial information about ecosystems and the users of ecosystem services. For instance, the hydropower plants located in specific watersheds receive ecosystem services such as regulation of water flow or reduction of erosion from upstream ecosystems. The model allows determination of the most important ecosystem for reducing the vulnerability of the hydroelectric sector in Costa Rica and may be useful for identifying priority locations for ecosystem management relevant to adaptation. The model considers vulnerability indices, land use, location and potential of power plants downstream, a matrix of production of services by ecosystems and utility of services for power plants.



Forests and water in Costa Rica

**Theme 2: Study of forest vulnerability to climate change at national and regional scales.** A major study is related to modeling the impacts of climate change on ecosystem distribution and runoff patterns. Results will allow identification of situations where ecosystem changes will exacerbate water problems or where ecosystems can help reduce the vulnerability of society to changes in water supply. Other research activities deal with the impacts of climate change on tree plantations and the occurrence of fire and pest outbreaks in natural or planted forests.

Important forest ecosystems providing services to hydroelectric power plants in Nicaragua



**Theme 3: Understanding of how society can participate in forest management for adaptation.** Trofcca has selected three case studies: two related to hydroelectric power generation and ecosystem services (Costa Rica and Nicaragua) and one related to drinking water and ecosystem services from pine forests (Honduras). Maintenance of hydrological functions and sediment control are relevant in the three cases. Additionally, Trofcca is **documenting successful institutional development for adaptation at the watershed level** based on past experiences, especially focusing on decisions made with respect to changes in the provision of ecosystem hydrological services. Alternative scenarios of land use and climate variability at the watershed level are used to **evaluate adaptation options that benefit both upstream and downstream stakeholders. The design and evaluation of financial mechanisms** that provide incentives for land-use decisions at local and national levels are included.



Hydropower dam with siltation problems in Costa Rica

## Conclusions

Trofcca in Central America works at two different scales. **At a regional scale**, research aims at understanding the vulnerability of forests and their ecosystem services. **At a local scale**, decision-making processes are explored for assessing the possible involvement of society in the management of forests for adaptation to climate change. **The interactive work with stakeholders** from the beginning of project activities is key to gaining their involvement in adaptation policy dialogues.

### Acknowledgments

This document has been produced with the financial assistance of the European Union. The contents of this document are the sole responsibility of the authors and can under no circumstances be regarded as reflecting the position of the European Union.

### For more information

[www.cifor.cgiar.org/trofcca](http://www.cifor.cgiar.org/trofcca)  
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