

# Chapter I

## Introduction

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Forest cover is decreasing or very low in many tropical landscapes following decades of logging, fire and other human disturbances. At the same time, there are large and growing areas of degraded forest lands<sup>1</sup> that need to be rehabilitated to again provide forest goods and services and meet local livelihood needs. National, international, local and private agencies have invested in innumerable rehabilitation initiatives in the tropics. Some countries such as China and the Philippines started earlier than others. Some countries are winding up large programs and others are initiating them. The initiatives have differed in scale, objectives, costs, implementation strategies, and in how much they considered socio-economic and institutional aspects. Lots of money has been spent, but have these efforts actually increased forest cover, helped local communities, enhanced biodiversity and environmental services, or contributed to meeting timber needs? Did they address the underlying degradation causes and were the rehabilitated areas maintained in the long term? What are the most promising approaches and what enabling factors are required to sustain the efforts?

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<sup>1</sup> There is no official term “degraded forest land” in China. We calculated degraded forest land to be the sum of five categories of forest land cover in the national inventory: barren land suitable for planting trees, burnt-over forest areas, logged-over areas, barren sandy land suitable for planting trees and *sparse forest*. Forest land in addition includes forests, shrub land (natural cover in parts of northern China), young plantations and seedling nurseries.

## 2 | Learning lessons from China's forest rehabilitation efforts

This report reviewing forest rehabilitation in China is part of a larger study by the Center for International Forestry Research (CIFOR) and national partners to assess efforts across six countries to try and answer the above questions and derive lessons for planning and guiding future efforts. The countries are Peru, Brazil, Indonesia, Vietnam, China and the Philippines. The study aimed to increase the chances of success for future rehabilitation efforts by identifying the approaches that contributed to longer-term sustainability and positive outcomes for different stakeholders. The CIFOR team designed and used common methods to be able to compare approaches, outcomes and influencing factors across the study countries. The methods were modified as necessary to fit the specific country contexts.

Rehabilitation of degraded forest lands has been ongoing in China for centuries. Efforts intensified late last century, starting from the 1980s. In 1998, China had about 64.2 million ha of degraded forest lands, with high livelihood pressures on these lands and remaining forests, particularly in the western regions. China's rapid economic development and construction activity since its 1978 policy reform has further increased the domestic demand for forest products, including sawn timber, plywood, panels, pulp and paper, furniture, bamboo and other non-timber products (Shi *et al.* 1997, Sun *et al.* 2004). Exports of China's cheap end products (most importantly furniture, paper and plywood) have also risen dramatically since the 1990s (Sun *et al.* 2004) and China has become the world's largest wood workshop (White *et al.* 2006). The country now faces a massive shortage of wood resources to feed its industries, and meet local consumption and international demand (Yin 1998, Bull and Nilsson 2004).

At the same time, continuing and expanding environmental problems have been attributed to deforestation and have generated concerns for forest conservation and rehabilitation (Shi *et al.* 1997, Li 2004, Liu and Diamond 2005). These include major flooding events as in 1998, the 200-day drought in 1997, severe soil erosion affecting 38 percent of the land area, desertification and sandstorms in the north and coastal typhoon damage. Increasing demand for environmental protection and national economic growth as well as development of the poorer western region, is at present driving massive forest rehabilitation efforts throughout the country. These efforts are accompanied by a logging ban or reduced allowable cuts in state-owned forest regions.

What has been the nature of these rehabilitation efforts and their outcomes? Did they meet or are they likely to meet their environmental, economic and social objectives? What are the constraints faced? It is imperative that China succeeds in its rehabilitation efforts in order to meet its growing demand for timber and environmental services. Failure on this front will not only affect China but also have global impacts due to continued imports of raw material (often unsustainably

or illegally sourced) and environmental degradation elsewhere (Katsigris *et al.* 2004). Additionally, could forest rehabilitation and management contribute to China's western region development plan and help alleviate poverty in that region as proposed?

This report presents the results of the China study which had two components:

- a) A national-level review of forest rehabilitation using the literature and inventory data.
- b) Review of forest rehabilitation in Guangdong Province
  - Using the literature and inventory data
  - Detailed characterisation and analysis of 22 cases, their outcomes and influencing factors using technical, socio-economic, financial and other parameters
  - Consultative workshop to understand the perspectives of key actors involved in rehabilitation projects.

The main objective of the study and this volume is to enhance the success and sustainability of forest rehabilitation efforts in Guangdong Province and China by:

- Assessing the characteristics and outcomes of past rehabilitation efforts,
- Assessing the main constraints and challenges faced, and
- Identifying and disseminating the most promising approaches and incentives that could lead to positive outcomes and long-term sustainability.

Guangdong is one of China's most economically-developed provinces, with many rehabilitation experiences, policy incentives and achievements to draw lessons from. Lessons learnt from China's and Guangdong's long rehabilitation history and diversity of approaches and institutional arrangements will be useful for other countries across the tropical and subtropical zone as well. Underlying concerns and motivations driving rehabilitation efforts are often similar.

## **1. Terminology and scope of the review**

Numerous terms have been used in the literature to refer to regrowing trees on formerly forested lands: rehabilitation, restoration, reclamation, reforestation and afforestation. Scientists, policy makers, practitioners and the public media tend to use these terms loosely and interchangeably. However, different authors define the terms relatively consistently based on the objectives, approaches used and the type of land targeted ([www.cifor.cgiar.org/rehab/\\_ref/glossary](http://www.cifor.cgiar.org/rehab/_ref/glossary)). Accordingly:

- Reclamation aims to enhance productivity and little of the original biodiversity. Exotic species are commonly used.

#### 4 | Learning lessons from China's forest rehabilitation efforts

- Restoration tries to recreate the original forest diversity, structure and function.
- Rehabilitation attempts to return the forest to a stable and productive condition, but not necessarily the original diversity, structure and function. It could include native and exotic species. The protective function and many of the ecological services of the original forest may be re-established.
- Afforestation refers to establishing a forest on land without forest cover in the recent past. Some authors suggest that afforestation includes only artificial means while others include planting, seeding and assisted natural regeneration.
- Reforestation refers to establishing a forest on recently deforested lands. Some authors qualify “recent” as < 10 years and others as < 50 years.

The generic term “rehabilitation” is used in the six-country study and in this volume to cover all activities designed to bring back trees on formerly-forested grasslands, brushlands, scrublands or barren areas for productive, livelihood and/or environmental purposes ([www.cifor.cgiar.org/rehab/\\_ref/study/index.htm](http://www.cifor.cgiar.org/rehab/_ref/study/index.htm)). It includes forest establishment via planting, seeding, assisted natural regeneration and agroforestry. In China the term “*afforestation*”<sup>2</sup> covers all such activities and includes forest establishment through planting trees, aerial seeding or “*mountain closure*”<sup>3</sup> on barren mountains, barren sandy land, *sparse forests*<sup>4</sup>, *burnt-over and logged-over forest areas*, and some *shrublands*<sup>5</sup> and *grasslands*<sup>6</sup>. It also includes planting trees along roads and rivers, around houses and villages and as shelterbelts in farms. Thus, the terms “rehabilitation” and “afforestation” are used interchangeably in this volume. The term “*greening*” commonly used in China refers to increasing forest canopy cover to a certain percentage or above, and is expected to result from *afforestation*.

Based on their end uses, the forest established could be classified as timber, fuelwood, protective, special use or economic forests (People’s Congress 1998). Protective forests are intended to help safeguard other forests, shrublands, roads, farmland, pasture land, riverbanks and coastal areas from soil erosion, wind and fire; stabilise sand dunes; and conserve watersheds. Special-use forests are for memorial, defence, research, environmental protection, scenic landscape or nature

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2 The term “*afforestation*” as used in China includes regreening recently deforested areas.

3 “*Mountain closure*” means closing public access to degraded forests and forest land with natural regeneration capacity to enable natural forest recovery.

4 *Sparse forests* are areas with less than 20 percent tree canopy cover (< 30 % prior to 1996).

5 Some natural shrublands exist in parts of China. In Guangdong, shrublands are mostly degraded vegetation types and identified as suitable for planting trees.

6 Large areas of natural grasslands/pasture lands exist in northern China. Grasslands in China are managed by the agricultural sector and some are identified as suitable for planting trees.

reserve purposes. *Economic forests or plantations* are for non-wood products such as fruits, edible oils, beverages, fodder, medicines, spices and industrial materials like rubber for cash income. Official forest cover in China thus includes more than in other countries: natural forests; commercial timber plantations; *economic plantations*; bamboo groves; some shrub lands specially prescribed by the State; farmland and coastal shelterbelts; and trees planted around villages, rivers, roads and houses (Rozelle *et al.* 2003).

This review covers initiatives with diverse scales, actors and approaches, but excludes rehabilitation of wetlands and mined areas. The original intention in this study was to assess forest rehabilitation initiatives on degraded forest lands or cleared forest lands with grass, shrub or barren cover. However, once the degraded forest lands were planted, the projects also cleared and planted low-yielding or degraded plantations which formed a percentage of land cover on most sites. It was difficult to separate out rehabilitation of degraded forest land from rehabilitation of low-yielding or degraded plantations and therefore both are included in this study. The degraded plantations often arose from earlier unsuccessful *afforestation* efforts.

## 2. Structure of this volume

Chapter II traces the development of forest rehabilitation in China since 1949, describing the actors, objectives, funding sources, driving forces, outcomes and key challenges as could be inferred from the secondary data and literature.

Chapter III looks more in detail at forest rehabilitation in Guangdong Province, using the literature, secondary data and a range of case studies to explore different aspects of interest such as project implementation activities, incentives, institutional arrangements and ensuing outcomes. It identifies the most promising approaches and incentives for long-term sustainability and positive outcomes for different stakeholders.

Chapter IV presents the stakeholders' perspectives on key rehabilitation constraints in Guangdong Province, and their recommendations for overcoming them.

Chapter V concludes the volume by highlighting the main findings from the study and providing key recommendations for the relevant stakeholders to support, plan, implement and sustain forest rehabilitation in Guangdong and China overall.

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