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# Handbook of Ecological and Ecosystem Engineering



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## Restoring Ecosystem Services of Degraded Forest Ecosystems in a Changing Climate

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### Abstract

Forests serve as repository deposits for carbon, besides providing various intangible and valuable ecological services to the humans and other living organisms. Their diversity imparts a crucial role in regulating various ecological processes. Carbon sequestration potential of forests is important for both adaptation and mitigation of global climate changes. The recent human impacts on the extent and types of forest degradation in India and also the impact of climate change in further enhancing degradation, require attention. Restoring the degraded forest ecosystems is crucial for maintenance of ecological services at local, regional and global scales. Successful restoration is possible by taking appropriate steps that involve the maintenance and integration of all environmental components of forest ecosystems for their proper functioning. This chapter highlights the alterations in soil nutritional status, hydrological protection, carbon sequestration potential and other ecological services, due to degradation of the forest ecosystems. Various techniques and policies for restoration and enhancement of quality of forests will be discussed in the light of projected climate change.

Keywords: Ecological services, Restoration, Degradation, Forest Ecosystem, Carbon Sequestration, Climate Change.

### 1. Introduction

Forests play a vital role in providing ecosystem services and also help in sustaining well being of humans (Matthews et al., 2014). They are the most diverse ecosystems and are storehouse of living carbon on the planet earth (Ahammad et al., 2019). Forests are gaining attention due to their social, cultural, ecological and economical advantages (FAO, 2016). Nearly 30% of world's