**Integrated forest landscape restoration in selected watersheds**

Background

**Nature-based solutions** (NbS) generally refer to the sustainable management and use of nature for tackling societal challenges such as [climate change](https://en.wikipedia.org/wiki/Climate_change), [water security](https://en.wikipedia.org/wiki/Water_security), [food security](https://en.wikipedia.org/wiki/Food_security), [human health](https://en.wikipedia.org/wiki/Human_health), and disaster risk management. For instance, the protection of mangroves in coastal areas can limit risks of coastal erosion associated to extreme weather conditions, while providing nurseries for fish production to feed local people and sequenstering CO2. Similarly greening roofs or walls can be used to cool down city areas during summer, to capture storm water, to abate [pollution](https://en.wikipedia.org/wiki/Pollution), and to increase human well-being while enhancing [biodiversity](https://en.wikipedia.org/wiki/Biodiversity) and connecting the city with the wider ecosystem. With NbS, healthy, resilient and diverse ecosystems (either ‘natural’, managed or newly created) are viewed as providing solutions for the benefit of our societies and overall biodiversity, in the face of global change. The term NbS was put forward by practitioners in the late 2000s (in particular the [International Union for the Conservation of Nature](https://en.wikipedia.org/wiki/International_Union_for_Conservation_of_Nature) and the [World Bank](https://en.wikipedia.org/wiki/World_Bank)) and quickly thereafter by policymakers in Europe (most notably the [European Commission](https://en.wikipedia.org/wiki/European_Commission)). While the term itself is still being framed, case studies from around the world exemplify its potential, as well as the added-value with respect to existing terms and concepts and in complementing traditional conservation approaches. As a consequence, NbS are on their way to being mainstreamed in national and international policies and programmes (e.g. climate change policy, law, infrastructure investment and financing mechanisms.

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| **Category of NbS approaches** | **Examples** |
| Ecosystem restoration approaches | Ecological restoration; Ecological engineering; Forest landscape restoration |
| Issue-specific ecosystem-related approaches | Ecosystem-based adaptation; Ecosystem-based mitigation; Climate adaptation services; Ecosystem-based disaster risk reduction |
| Infrastructure-related approaches | Natural infrastructure; Green infrastructure |
| [Ecosystem-based management](https://en.wikipedia.org/wiki/Ecosystem-based_management) approaches | Integrated coastal zone management; Integrated water resources management |
| Ecosystem protection approaches | Area-based conservation approaches including protected area management |

 (“Nature Based Solutions - Wikipedia,” n.d.)

The widespread loss and degradation of native forests is now recognized as a major environmental issue. The problem is so acute that it is justifiably referred to as a ‘deforestation crisis’ (Spilsbury, 2010). Recent reviews indicate that while the rate of deforestation is slowing in some countries, the overall rate of forest loss remains high, estimated at around 130,000 km2

/year during the decade

2000–2010 (FAO, 2010; Secretariat of the Convention on Biological Diversity, 2010). Deforestation figures fail to provide a complete picture, however, as many remaining forests are being severely degraded through the use of fire, cutting and herbivory. Accurate data on the extent of forest deg- radation at the global scale are difficult to obtain, but an indication of its impact is provided by a recent estimate of the amount of carbon stored in forest vegetation. Over the period 1990–2005, global forest carbon stocks declined by almost double the decline in forest area (UNEP, 2007).

In response to forest loss and degradation, increasing efforts are being directed towards eco-logical restoration. Forest restoration refers to the process of assisting the recovery of a forest ecosystem that has been degraded, damaged or destroyed (Mansourian, 2005). This may involve the re-establishment of the characteristics of a forest ecosystem, such as composition, structure and function, which were prevalent prior to degradation (Jordan et al., 1987; Hobbs and Norton, 1996; Higgs, 1997). Ecological restoration has been defined in a variety of ways in the past; earlier definitions indicated that the purpose of restoration is the comprehensive re-creation of a speci- fied historical ecosystem, including structural, compositional, and functional aspects. Such defini- tions emphasize the importance of historical fidelity as an endpoint of restoration. In contrast, more recent definitions allow a more flexible set of objectives, noting that cultural values may be important and that a range of ecological variables can be acceptable as endpoints (Newton & Tejedor, n.d.) .Deforestation and forest degradation in Ethio- pia have a long history with a significant spa- tial variation. The northern half of the country has experienced cyclic deforestation and revegetation over the past three millennia, while deforestation in the southern half is a relatively recent phenomenon (Darbyshire et al. 2003, Nyssen et al. 2004, Dessie 2007). This spatial variability has been conditioned by factors such as population growth, emergence of intensive agriculture, expansion of urban areas, and trade (Darbyshire et al. 2003, Nyssen et al. 2004). Deforestation has intensified, including the major southward expansion, since the 1950s (Dessie 2007, Bekele 2008). Estimates of deforestation rates range from 140 000–200 000 ha per year (Reusing 1998, FAO 2010), and at present only about 12.3 million ha (11% of the land area) of forest cover remains (Lemenih, Negash, & Teketay, 2007) Forest rehabilitation in Ethiopia includes different types of strategies and actors. Various agroforestry, reforestation/afforestation, area exclo- sure, and woodlot development are popular strategies of restoration observed today (Teketay et al. 2010). The main actors include governmental and non-governmental agencies and the private sector. Interestingly, the forest-management approaches have evolved for the better over time. Earlier approaches focused more on reforestation/afforestation and conservation through state centered coercive and top-down approaches, whereas more recent approaches attempt to combine participatory and decentralized approaches that include engagement of NGOs and the private sector. The management approach has also shifted in recent decades from large block industrial plantations of the 1960s and 1970s to small-scale forest plantations in the form of woodlots integrated into agricultural landscapes (Lemenih et al., 2007)Lemenih, M., Negash, M., & Teketay, D. (2007). Rehabilitation of degraded forest and woodland ecosystems in Ethiopia for sustenance of livelihoods and ecosystem services, 299–313.

Nature Based Solutions - Wikipedia. (n.d.).

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