

# Assessing the evidence base for nature's contributions to people through forest restoration and reforestation in the tropics

Robin Chazdon, Sarah Wilson, Manuel Guariguata, Patricia Balvanera, Agnieszka Latawiec, Unai Pascual, Nicole Sibelet, and Bernardo Strassburg.

55<sup>th</sup> Annual meeting of Association for Tropical Biology and Conservation, Linking Natural History and the Conservation of Tomorrow's Tropical Ecosystems, July 1-5, 2018, Kuching, Sarawak, Malaysia.

## **Abstract**

**Introduction:** Transforming extensive areas of degraded and deforested lands into restored ecosystems and landscapes is a global imperative. Yet, we lack a clear understanding of how different modes of reforestation improve ecosystem and landscape functions and how these improvements benefit different stakeholders. Changes in ecosystem properties during reforestation depend on the environmental context and the approach used. Reforestation approaches include commercial tree plantations, spontaneous and assisted natural regeneration, restoration plantings of native species, and agroforestry.

**Objective:** Based on a broad socio-ecological approach based on a Nature's Contributions to People (NCP) framework of the IPBES, we disaggregate the benefits that emerge from these five different reforestation approaches, assessing their implications for different stakeholders and the value tradeoffs among them that can potentially lead to social conflict and inequity. These conflicts can jeopardize short- and long-term outcomes of restoration.

**Methods:** We conducted a rigorous literature search to synthesize published information on the quantity and quality of nine NCPs across different restoration approaches, encompassing direct and indirect material and non-material contributions. We then surveyed literature on perceived and realized benefits and costs across NCPs that vary widely across stakeholder groups at different scales.

**Results:** Different modes of restoration provide NCPs at different levels and rates, leading to tradeoffs among types of benefits flows. The evidence base for NCPs from reforestation, however, is sparse and inadequate. Value tradeoffs can potentially create social conflict, inequality and restricted benefits to stakeholder groups involved in co-production of NCPs. Moreover, as benefits for stakeholders change over time, they are strongly affected by discounting rates and future societal expectations as well as how planning, management and governance of restoration is carried out. Our literature review reflects an emphasis of studies on carbon storage during reforestation and restoration, but few robust comparisons among different approaches. Even less information is available on temporal trajectories of NCP, which are needed to evaluate tradeoffs, to validate process models, and to develop realistic scenarios for planning restoration. Further, few studies have addressed how these NCPs impact different stakeholders at local and regional scales.

**Conclusions:** We conclude by presenting a framework for assessing the benefits and burdens of NCP during forest restoration in the global tropics.

Paper Number: 320 Wednesday, 04 July 2018 | Taj Mahal Symposium 27 - Socio-ecological dimensions of forest transitions and second growth forests in tropical landscapes