

'Rainfall Recycling' as a Landscape Function: Connecting SDGs 6, 13 and 15



▲ Photo by M. Edliadi/CIFOR

Discussion Forum

Tuesday, Dec. 19, 2017

2pm – 3.30pm

World Conference Center,
Platz der Vereinten Nationen 2,
Bonn, Germany

Climate change is now a reality and, for those most affected by it, it is often experienced as a change in the most basic commodity: water. Drawing on the insights of farmers and local communities, this session examines the role of forests in regulating the water cycle. And there are new, recent insights: new research suggests that vegetation plays a critical role in the frequency and intensity of rainfall.

This discussion forum will explore the implications on the many areas affected by these effects — land restoration, water management and climate change adaptation — toward an integrated approach for land/water and climate for the SDGs.

Organized by the CGIAR Research Program on Forests, Trees and Agroforestry (FTA) and International Union of Forest Research Organizations (IUFRO), this event will shed new light on the role of forests and trees in the climate debate, building on an [online symposium](#) held in May 2017 and on a scientific review paper on the relationship between forests and water titled [Trees, forests and water: Cool insights for a hot world](#).

It will also discuss preliminary highlights of the current [Global Forest Expert Panel \(GFEP\) on Forests and Water](#), which is expected to issue a policy relevant global assessment report in July 2018.

The forum will focus on the relevance of this science for policies and implementation efforts related to climate change, land restoration, landscape management and food security and, thus, will aim to contribute to a new agenda for coordinated science-policy interaction.

Discussion objectives

- Displaying the latest scientific findings on rainfall recycling and climate regulation in relation to forests and tree cover
- Exploring the implications of these new scientific insights on climate, land, water and related policies and actions
- Sketching a new agenda on water/land and climate, for coordinated science-to-policy linkages, from cross-cutting policy integration to implementation on the ground, and triggering interest for institutional and donors support

New scientific perspectives on forests, rainfall and climate

At present, climate policy largely puts a “mitigation” sticker on forests and land for their role in climate, emphasizing the carbon stored in forests and peat soil, and the capacity of trees to sequester carbon. This has triggered much scientific work and many publications on the best pathways to strengthen the role of forests and trees in climate mitigation. It has also triggered many debates, in science and in policy, as to whether or not this is the right approach.

However, this perspective on forests and climate change could change radically – and the change may come not from carbon, but from water. A range of recent findings accompanied by the level of confidence in the underlying scientific evidence as assessed during the May 2017 [online symposium](#) are as follows:

- Trees influence local temperature through high transpiration rates, and remote sensing and infrared tools exist for visualizing this effect (very high confidence).
- Forests recharge atmospheric moisture and regional evapotranspiration responds to tree-cover transitions (very high confidence).
- Vegetation and trees influence cloud formation and trigger rainfall via bio-precipitation effects (high confidence).
- Historical evidence from tree rings and their isotopic composition shows decadal variation and local influences of land use on local rainfall and climate (medium confidence).
- Rainbow (atmospheric) water bookkeeping combined with prevailing winds shows continental-scale teleconnections on all tropical continents. Forests enable cascading transport of water vapor over distant locations, and therefore rain, far from the sea (high confidence on qualitative effects, need to qualify uncertainty at quantitative and site-specific levels).
- Forests, as biotic pumps, attract air and moisture flows, and the loss of forests can create a tipping point turning wet climates to dry climates (medium confidence).
- Trees and forests can improve groundwater recharge, with the existence of an optimum level of tree cover for that effect (high confidence).

Rainfall recycling can be understood as the result of three conditions and processes: the availability of atmospheric moisture over land, the triggering of rainfall and the movement of air masses and associated moisture. The net effect of the three processes is that forests, wetlands, irrigated agriculture and trees outside of forests, all responsible for above-average evapotranspiration, not only have a direct cooling effect, but also enhance rainfall recycling.

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What are the implications for action?

These findings invite us to look at forest and tree cover in landscapes through their “rainfall recycling” functions at different scales, up to continental levels.

They suggest the opportunity for a paradigm shift in science and research to invest more in the forest-climate change field beyond carbon, and to work at the forest-water cycle interface.

They also have implications for the design and implementation of climate policies, restoration and integrated landscape policies that the forum will discuss. In practice, they offer new leverages on how to improve food security (and preserve grain baskets downwind) through land restoration activities. Thus, they provide an effective way to enhance synergies for reaching SDGs 6, 13 and 15.

Agenda

Opening by **Alexander Buck**

Executive Director of the [International Union of Forest Research Organizations \(IUFRO\)](#)

Part 1: New insights from the science of rainfall recycling

The first part of the forum will be a panel discussion on the science of rainfall recycling in relation to forests and tree cover.

- **Panel discussion:**

- **David Ellison**

- Swedish University of Agricultural Sciences (SLU) and Ellison Consulting, lead author of the [Trees, forests and water: Cool insights for a hot world](#) paper, and member of the IUFRO Global Forest Expert Panel on Forests and Water

- **Aster Gebrekirstos**

- [World Agroforestry Centre \(ICRAF\)](#)

- **Aida Bargues-Tobella**

- Swedish University of Agricultural Sciences and coauthor of [Intermediate tree cover can maximize groundwater recharge in the seasonally dry tropics](#)

- **Discussion with the audience:**

- Moderated by **Meine van Noordwijk**

- Cochair of the IUFRO [Global Forest Expert Panel on Forests and Water](#) and lead author of [Ecological rainfall infrastructure: investment in trees for sustainable development](#)

Related reading

- [Trees, forests and water: cool insights for a hot world](#)
- [Ecological rainfall infrastructure: investment in trees for sustainable development](#)
- [Intermediate tree cover can maximize groundwater recharge in the seasonally dry tropics](#)
- [Cool insights for a hot world: trees and forests recycle water and modify climate](#) symposium recordings
- [Trees, water and climate: Cool scientific insights, hot implications for research and policy](#)
- [Cool insights for a hot world: trees and forests recycle water](#)
- [Managing forests for water and for climate cooling](#)
- [IUFRO Global Forest Expert Panel \(GFEP\) on Forests and Water](#)
- [IUFRO-GFEP slideshow](#)

Part 2: Implications for climate, land, water and related policies and actions

A second panel discussion will address implications for climate and related policies, such as restoration, integrated landscape policies, food security and the Sustainable Development Goals (SDGs).

- **Panel discussion:**

- **Meine van Noordwijk**

- [Global Forest Expert Panel on Forests and Water](#)

- **Holger Hoff**

- [Potsdam Institute for Climate Impact Research](#) and [Stockholm Environment Institute \(SEI\)](#)

- **Third speaker TBC**

- **Discussion with the audience:**

- Moderated by **Paola Ovando Pol**

- [Eawag \(Swiss Federal Institute of Aquatic Science and Technology\)](#), and member of the IUFRO [Global Forest Expert Panel on Forests and Water](#)

Part 3: Who can do what?

- **Open forum:**

- Moderated by **Vincent Gitz**

- [Center for International Forestry Research \(CIFOR\)](#) and Director of the [CGIAR Research Program on Forests, Trees and Agroforestry \(FTA\)](#)

- **Key issues to be addressed:**

- What are the roles of various actors in this field, from the perspective of all participants?
 - What elements are needed to map a new agenda for coordinated science-to-policy linkages?
 - What do stakeholders see in terms of implications of this science in different policy and implementation domains, such as climate change, land restoration, landscape policies or food security?
 - What is next and who can do what?

Wrap-up by **Vincent Gitz**

[Center for International Forestry Research \(CIFOR\)](#) and Director of the [CGIAR Research Program on Forests, Trees and Agroforestry \(FTA\)](#)

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The CGIAR Research Program on Forests, Trees and Agroforestry (FTA) is the world's largest research for development program to enhance the role of forests, trees and agroforestry in sustainable development and food security and to address climate change. CIFOR leads FTA in partnership with Bioversity International, CATIE, CIRAD, ICRAF, INBAR and TBI.

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