

HIGH TREE & VEGETATION COVER REDUCE WATER, NUTRIENTS AND SOIL LOSS

Suzanne Jacobs and Mariana Rufino



Why are TREES important?

HIGH TREE COVER

WATER

- Dense tree canopies intercept heavy rainfall and complex and deep rooting systems take up water from different soil layers.
- Forest and trees on farm retain rain water before reaching the soil, resulting in LOW overland flow and LESS risk of flooding.
- Water recycling from evapotranspiration and high water use by trees result in MORE rainfall and a COOLER environment.
- More infiltration and retention of rain water in the soil results in MORE spring water.

NUTRIENTS

- Litter from trees provides nutrients to the soil and complex rooting systems can take up these nutrients from different soil layers.
- Nitrogen-fixing trees and organic matter from leaves and branches improve soil fertility with LOWER fertilizer requirements.
- Higher recycling of nutrients in natural ecosystems with LOWER loss of nutrients.
- Deep-roots of trees can take up nutrients from deep soil layers in-creasing soil nutrient recycling.

SOIL & SEDIMENTS

- Dense tree canopies protect the soil surface from heavy rainfall.
- Tree canopies decrease the speed of rain drops reaching the soil surface and there is LESS soil disturbance.
- Less rain reaches the ground during heavy storms and there is LESS soil erosion.
- Roots and vegetation trap soil in the landscape with LESS soil going to rivers and streams.

HIGH TREE COVER

WATER

- Poor tree canopy intercepts little rainfall and limited rooting systems take up water from superficial soil layers.
- Less vegetation retain rain water and compacted soil result in HIGH overland flow and MORE risk of flooding.
- High evaporation from bare soil and less water retention due to simple rooting system results in DRIER soils in the dry season.
- Less infiltration of rain water in the soil results in LESS spring water.

NUTRIENTS

- With few trees, LESS nutrients are recycled into the soil and simple rooting systems take up LESS of these nutrients.
- Crop harvests remove nutrients from the ecosystem, and MORE fertilizers are required to grow crops.
- Fertilizers can leach into deeper soil layers or flow into stream when it rains with potential HIGH loss of nutrients.
- Leaching of nutrients below the rooting zone of crops results in HIGH nutrient levels in groundwater and streams.

SOIL & SEDIMENTS

- With few trees, NO dense canopy can protect the soil surface.
- Rain drops reach the soil surface with high speed causing HIGH soil disturbance.
- Bare soil is exposed to storms and there is more often HIGH soil erosion.
- Fewer roots and vegetation can trap soil in the landscape and FERTILE soil ends up in the rivers and streams.

EPUKA UDONGO ULIO WAZI ULINDAJI WA MISITU, MITI NA NYIKA



cifor.org/water-towers

forestsnews.cifor.org



Center for International Forestry Research (CIFOR)

CIFOR advances human well-being, equity and environmental integrity by conducting innovative research, developing partners' capacity, and actively engaging in dialogue with all stakeholders to inform policies and practices that affect forests and people. CIFOR is a CGIAR Research Center, and leads the CGIAR Research Program on Forests, Trees and Agroforestry (FTA). Our headquarters are in Bogor, Indonesia, with offices in Nairobi, Kenya; Yaounde, Cameroon and Lima, Peru.

