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Smithsonian Offers Free Publication to Inform Tropical Land-use Decisions

Forty percent of the world's people share the tropics with 50 percent of the world's terrestrial life. The world's population has more than doubled since 1960. Land-use decisions will become increasingly controversial as the planet's population soars from 7.2 billion to a projected 9.6 billion in 2050. A [downloadable publication](#) from the Smithsonian and the BIO Program of the Inter-American Development Bank, "Managing watersheds for ecosystem services in the steepland Neotropics," offers new tools to weigh trade-offs between water, timber, biodiversity and development.

"Clean water is fundamental to almost all of the benefits that humans receive from forested watersheds," said Matthew C. Larsen, hydrologist and director of the Smithsonian Tropical Research Institute (STRI) in Panama. "In addition to sustaining healthy forests, water sustains public irrigation and drinking-water supplies, complex tropical ecosystems, biodiversity and ecotourism. Smart reforestation will mitigate life-threatening natural events such as floods and landslides." Access to adequate clean-water supplies is one of the biggest challenges for the coming century. Hundreds of millions of people derive benefits, particularly drinking water, from steeplands, hilly or mountainous regions with a slope of 12 percent or more in tropical regions of Central and South America. Although conservationists stress the value of ecosystem services such as clean water and climate-change mitigation provided by natural environments, the information needed to evaluate tradeoffs has often been in short supply.

"This 'Watershed White Paper' summarizes the latest science and highlights the importance of integrated watershed management to meet the challenges of meeting the needs of billions of people who depend on food, timber and clean water in the tropics and in our globalized economy," said Jefferson Hall, STRI staff scientist and lead editor.

The new report is the result of a conference held in March 2014 at STRI, where researchers are conducting a major 700 hectare (about 1730 acre) land-use experiment in the Panama Canal

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watershed. The conference, supported by the BIO Program, was led by the Environmental and Training Initiative of Yale University's School of Forestry and Environmental Studies (FES), and PRORENA, a joint program by STRI and FES to promote the use of native species in reforestation.

New data on watershed management and advances in management policies are featured in the document, which also provides an overview of socioeconomic factors, including governance issues, that challenge the management of watersheds for everyone's benefit.

Five case studies from tropical Latin America demonstrate how science informs watershed management. The report provides links to watershed-management initiatives across the region, including several "water funds," a system of payments for ecosystem services in which downstream users contribute to a trust fund to support upstream activities that provide them with a reliable clean-water supply. It also includes 85 links to further information, including four interactive maps.

To encourage public participation in land-use decisions, the document is written so it is accessible to anyone with a secondary school education. The 27 authors provide a set of guiding principles for sustainable watershed management as powerful tools for policy and decision makers at all levels of government and high school and university students.

The Smithsonian Tropical Research Institute, headquartered in Panama City, Panama, is a unit of the Smithsonian Institution. The Institute furthers the understanding of tropical nature and its importance to human welfare, trains students to conduct research in the tropics and promotes conservation by increasing public awareness of the beauty and importance of tropical ecosystems.

Website: www.stri.si.edu.

Reference: Hall, Jefferson S., Vanessa Kirn, and Estrella Yanguas Fernández (editors). 2015. [Managing watersheds for ecosystem services in the steepland Neotropics](#). Smithsonian Tropical Research Institute/Inter-American Development Bank: Panama City, Panama.

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