

RESEARCH BRIEF

Photo courtesy of 2009CIAT/Neil Palmer

MAY 2020

Forest Loss and Human Activity Leads to Disease Transmission

As humans expand their activities into forests and natural lands, their chances of coming into contact with wild animals increases and with it, the opportunity to transmit infectious disease.

Background

Deforestation along with the fragmenting of natural or wildlands has been identified as one of the primary processes that allows for direct transmission of zoonotic – animal to human – infections. As humans continue to convert these landscapes for agricultural activities and decrease the boundary lands that exist between rural settlements and forest, animal movements also become restricted. This fragmenting of natural landscapes further places humans into closer proximity with wild animal habitats, while the loss of forests may make animals more likely to raid croplands for food, opening up new routes for disease transmission.

Human behaviors also provide opportunities for direct contact between people and wildlife (such as non-human primates). Economic or livelihood-based activities, such as collecting firewood or small trees for construction as well as foraging and hunting for food in forested habitat, significantly increases the likelihood of human-wildlife contact. New Stanford research provides important findings

POINTS FOR POLICY MAKERS

- ▶ **Physical contact between humans and primates can result in the transmission of infectious diseases in rural populations living near protected forests in Africa.** This contact may also result in physical harm and possible increases in tension between humans and wildlife.
- ▶ **Landscape changes such as forest fragmentation coupled with livelihood activities in the forest area significantly increase the likelihood of human contact with a primate.** Increasing fragmentation of forests for agriculture, firewood and timber collection also increases the chance of human-wildlife contact as the local populations hunt and forage for food further into the forest and boundary areas.
- ▶ **Improved prediction of the likelihood of physical interactions between humans and primates is key to assessing the risk of zoonotic emergence in rapidly changing landscapes across the globe.** Encouraging reforestation programs in protected lands and creating physical buffer zones between human and wild animal habitats could dramatically lessen the likelihood of human-wild primate interaction.



Photo courtesy of Laura Bloomfield

linking both landscape changes, such as forest fragmentation, and human activity as joint factors that lead to animal to human disease transmission.

Small-scale farmers who live near forest fragments located outside Kibale National Park in Uganda serve as a case study to observe the relationship between the livelihood activities of residents and the likelihood of coming into contact with at least one wild primate. By combining land use data with residents reported behavioral patterns, the odds of human-animal contact could be predicted by analyzing the length of the forest boundary around people's homes and the frequency with which they ventured into these forested areas.

Pressure from local communities to convert landscapes for agriculture usage is not confined to the boundary of Kibale National Park and will likely continue to increase worldwide as populations grow. These deforestation activities will also increase the probability that more human-wild animal interactions will occur and with them, the opportunity to transmit and spread infectious diseases. One promising outcome from Kibale is that the tree preservation within the Park's border from both enforcement efforts and a carbon sequestration reforestation program lessen the possibility for human-animal interactions inside the Park to occur and offer an example that could be replicated in the border areas between wild and cultivated landscapes.

ABOUT THE AUTHORS



Eric Lambin

Eric Lambin is the George and Setsuko Ishiyama Provostial Professor of Earth, Energy & Environmental Sciences and Senior Fellow at the Stanford Woods Institute for the Environment.



Laura Bloomfield

Laura Bloomfield is a Ph.D. candidate in the Emmett Interdisciplinary Program in Environment and Resources (EIPER) at Stanford and a M.D. candidate in the School of Medicine.

This brief is based on the paper “**Habitat Fragmentation, livelihood behaviors, and contact between people and nonhuman primates in Africa**” published in *Landscape Ecology* (2020).



Photo courtesy of Laura Bloomfield

FOR MORE INFORMATION

Office of External Affairs
Stanford Woods Institute for the Environment
woods-extaffairs@stanford.edu
woods.stanford.edu