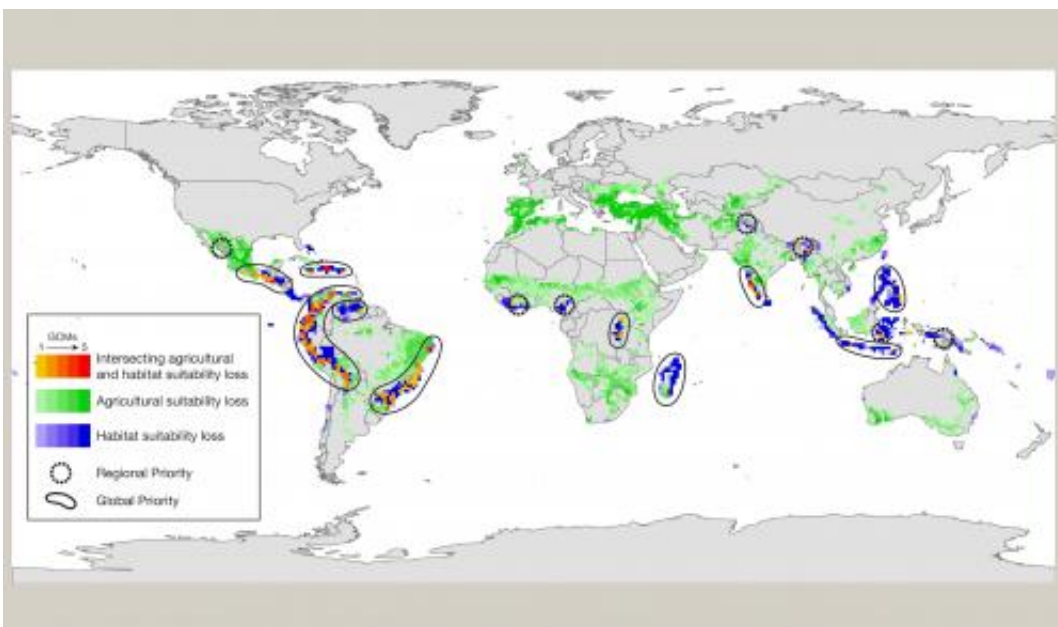# Scientists identify top ten priority regions for climate adaptation funding to secure food security and biodiversity

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A new study investigating the impacts of climate change has identified ten global priority regions where targeted funding for building resiliency and adapting to the impacts of climate change would provide the greatest benefits to both people and the natural ecosystems that support life on Earth. The regions identified in the study, ranging from Africa to South America, to Central Asia and the Asia-Pacific region, are areas where

small-scale farmers will be most affected by climate change and where Biodiversity Hotspots are also located.

The ten priority regions with the greatest potential benefits to humanity include:

- Central America – Mexico, Guatemala, Honduras, Nicaragua (Hotspots: Mesoamerica; Madrean pine-oak woodlands)
- Caribbean – Jamaica, Haiti, Dominica, Puerto Rico, Venezuela (Hotspots: Caribbean Islands)
- Andes (South America) – Argentina, Bolivia,Colombia, Ecuador, Peru (Hotspots: , Tumbes-Choco-Magdalena / Tropical Andes)
- Guiana Highlands – Venezuela (Hotspot: Tropical Andes)
- Atlantic Coast of Brazil (South America) – Brazil (Hotspot: Atlantic Forest)
- Albertine Rift – Zaire, Burundi, Tanzania, Uganda (Hotspot: Eastern Afromontane)
- Madagascar – Madagascar (Hotspot: Madagascar and Indian Ocean Islands)
- Ghats – India (Hotspots: Western Ghats, Sri Lanka)
- Philippines – Philippines (Hotspot: Philippines)
- Java – Indonesia (Hotspot: Wallacea)

Published in the journal *PLOS ONE*, "Global Climate Change Adaptation Priorities for Biodiversity and Food Security," represents the first global study to combine assessments of the impacts of climate change on both agriculture and biodiversity, in order to identify joint priorities.

Researchers at Conservation International and BirdLife International announced the findings of the research today, which was carried out in partnership with researchers from the University of California at Santa Barbara, the University of Kansas, Seoul National University and Lincoln University of New Zealand. About the findings, lead author and

Senior Climate Scientist at Conservation International Lee Hannah said, "This research shows that the futures of poor farmers and wildlife are intertwined in many regions."

The research used modeling of crops important to smallholder farmers, such as corn and beans, and models of bird responses to climate change to identify areas in which change was high in both crop and habitat suitability. It also used bird species with restricted ranges as a surrogate for wildlife more generally, because birds are much better known than other comparable groups of species.

"Natural ecosystems support farmers in many different ways, such as through sustaining pollinators and pest-controlling species, while farmers' responses to climate change will often have consequences for species and ecosystems," said Dr Stuart Butchart, Head of Science at BirdLife International and a co-author of the study. "Our results identify some of the highest priority areas to invest in joint solutions that simultaneously address the human and ecosystem dimensions of climate change."

The authors of the study say that action to help farmers and wildlife is urgently needed in the areas identified. Such actions could include work with farmers living in forested areas or promoting more biodiversity-friendly cropping techniques such as growing 'shade' coffee.

"The study identifies the top ten regions across the world for climate change impacts on farming and nature, and literally puts them on the map," said co-author Patrick Roehrdanz of the University of California, Santa Barbara. US $30 billion was committed by developed countries towards climate change adaptation and mitigation funding for the most vulnerable countries in 2009 at the 15th Conference of the Parties (COP 15) to the United Nations Framework Convention on Climate Change (UNFCCC) in Copenhagen.

Investment of climate change adaptation funding in the ten priority areas could simultaneously address human and natural impacts of climate change. Because such multi-sector planning is in its infancy, these areas can serve as models for multiple impact investment in other regions. The high proportion of the world's poor and restricted-range species found in these regions makes them high priority for international investment for other reasons as well. More detailed planning is now needed to identify specific site-level opportunities in each region.

The ten regions identified all intersect with global Biodiversity Hotspots and cover 13-percent of currently cultivated land in the tropics and 7-9-percent of the world's population living in poverty. These priority regions have high likely return on climate adaptation investments in both poverty reduction and conservation.

The researchers also identified an additional seven regional priority areas that, while apparently less important at a global scale, may still be critical targets for regional conservation scientists, policy and decision-makers.

Regional Priorities for joint adaptation for people and wildlife:

- Northwest Mexico – Mexico (Hotspot: Mesoamerica; Madrea pine-oak woodlands)
- West Africa – Ivory Coast (Hotspot: Guinean Forest of West Africa)
- Cross River – Cameroon, Nigeria (Hotspot: Guinean Forest of West Africa)
- Western Himalaya – Pakistan (Hotspot: Himalaya)
- Eastern Himalaya – India, Myanmar, Bhutan (Hotspot: Himalaya)
- Sulawesi – Indonesia (Hotspot: Wallacea)
- New Guinea – Papua New Guinea, Indonesia (Hotspots: Sundaland and Wallacea)

More information: www.plosone.org/article/info:d … journal.pone.0072590