Helping balance conservation needs with growing pressures for land

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As the global demand for land increases, we need to both meet this demand and ensure we address climate change and nature conservation. Yet, how does a government know what land is most important to protect? How do policymakers know what might be the impact of new agricultural or infrastructural developments on nature and its

contribution to people?

While good quality global data on everything from population density to precipitation and deforestation are now available, these are complex and inaccessible to many decision-makers. They are also not easily tailored to specific decision-making needs.

To address this, King's researchers have developed user-friendly online tools that allow anyone with access to a computer to better understand the multiple impacts of land use and land use change. The tools also help make better decisions based on the context and identify the most important areas for conservation investment.

Around 3,500 organizations in more than 180 countries, including governments and non-governmental organizations (NGOs), have used the tools to contribute to discussions and decision-making on land use. This includes using the tools to guide conservation decisions in Ecuador and Brazil, to establish 1.5 million hectares of protected area in Bolivia, and to support land use and management projects that help reduce greenhouse gas emissions in line with international climate commitments.

Simplifying the complexity of nature conservation

Defining protected areas involves complex trade-offs. It includes factoring in the economic and livelihood value of the land—not only to the locals, but also to those living downstream or nearby—as well as land rights and any lost opportunities, such as for energy or food production. Land is important for maintaining biodiversity and multiple ecosystem services, such as climate and flood regulation, water, fuelwood and timber provision, as well as culture and spiritual values.

Identifying what land to conserve or which nature conservation to

finance requires large amounts of complex data. The two online systems developed by King's and partners, Co$tingNature and WaterWorld, produce dynamic and accessible "digital maps" and analyses to provide policy support for a range of land use questions for any country or region.

The tools do this by integrating new concepts, models and comprehensive global datasets across biodiversity, hydrology, ecosystem services and land/water management. The datasets underpinning the two tools form the most comprehensive global geographic database of any public environmental policy support system.

"By bringing together and curating such a wide diversity of datasets with state-of-the-art modeling, King's research has promoted the concept of complex 'bundles' of multiple ecosystem services, rather than narrowly-defined priorities, such as water or carbon alone," says Professor Mark Mulligan, lead researcher on the project.

Tool #1: Co$tingNature

Co$tingNature provides support for prioritizing investments in nature conservation, by mapping and valuing 18 ecosystem services (that is, the benefits people obtain from nature), including carbon sequestration, firewood provision and nature-based tourism.

A variety of international NGOs use the tool to better prioritize geographies for conservation investments, test the impact of conservation interventions and support local stakeholders in scenario analysis. Co$tingNature, for example, was one of the most important divers in a major non-profit's project to secure funding for a new 1.5 million hectare protected area in Bolivia.

Tool #2: WaterWorld

WaterWorld provides policy support for managing land, while improving water resources.

A major development bank used the tool to evaluate three forest conservation investments in Ecuador and Brazil. WaterWorld was used to model and value the effect on water quality in areas with reduced deforestation in conservation projects funded by the bank.

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