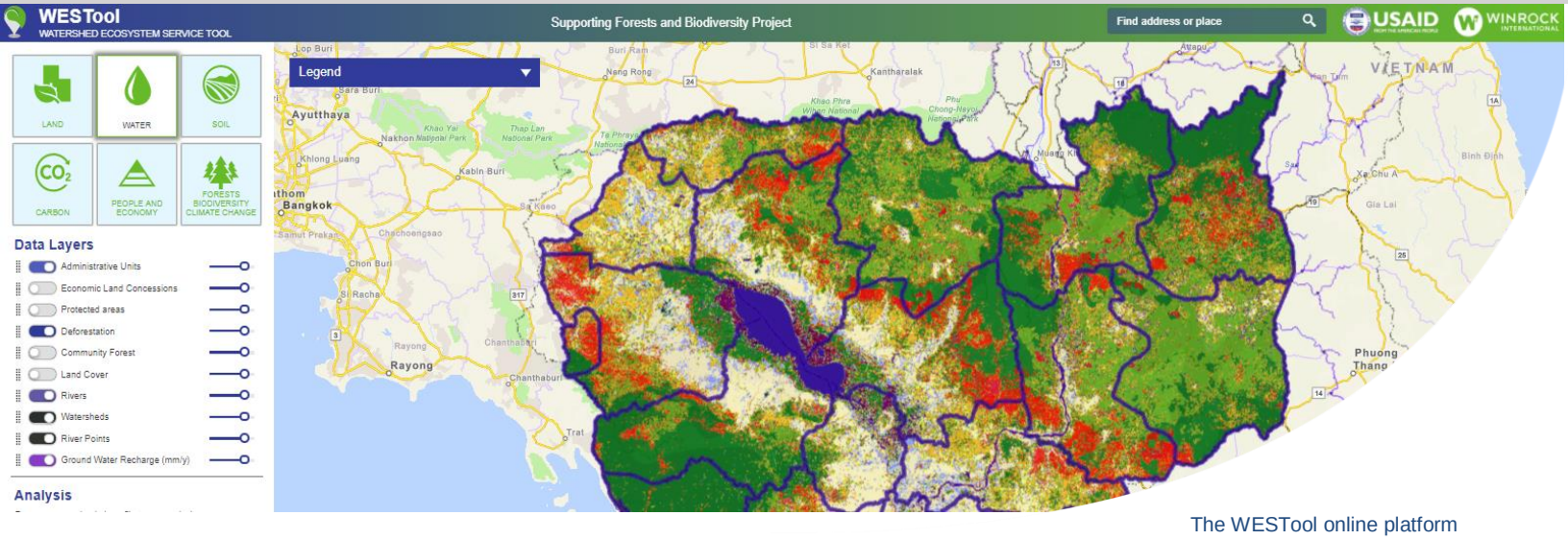

The WESTool online platform
www.winrock.org/westool

Watershed Ecosystem Services Tool (WESTool)

Societies in Southeast Asia are experiencing rapid transformation of their natural landscapes and economies. While such advances do have the potential to result in lasting economic development and increased food security, conversion of forest lands can lead to severe and lasting damage to the provision of *ecosystem services* on which communities and economic sectors rely. This includes access to clean water, soil fertility, and air quality. Such negative impacts cannot be entirely avoided in a growing country, but careful planning and prioritization of development activities can reduce risk to the economy, local livelihoods, and ecosystems. To improve planning for sustainable development there is an urgent need for accessible, cross-disciplinary, tools that enable policy makers and private companies to estimate the impact of competing options early in a planning process.

In response to this need, the USAID Supporting Forests and Biodiversity (SFB) in Cambodia developed the Watershed Ecosystem Service Tool (WESTool - https://www.winrock.org/westool/). The WESTool is an online spatial planning tool with various layers of maps that allow users to interactively explore trends in regional land use change, evaluate the impact of past and future development on multiple ecosystem services, and weigh risks and uncertainties associated with climate change.

At all geographic scales, WESTool can be used to explore the historical and future impacts of deforestation and land conversion in Cambodia on

- Soil erosion & waterway sedimentation
- Soil nutrient loss
- Nutrient loading in waterways
- Groundwater availability
- Greenhouse gas emissions

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the following ecosystem services:
Additionally, each ecosystem service can be evaluated with consideration of the risk of future climate change.

Developed through a stakeholder-driven process, the WESTool was designed to meet the needs of local and national government actors, NGOs, and educators. The WESTool's map-based platform allows specialist and non-specialist stakeholders in land use development and conservation processes to explore impacts at a wide range of scales -- from local, small-scale assessments to national evaluations.

What makes WESTool especially powerful is the seamless integration of a user-friendly online interface with advanced, science-based, spatially explicit, and transparent analyses that leverages the most current remote sensing data, advanced hydrologic modeling, and global climate change scenarios. Because it employs existing and updated global remote sensing products, the WESTool is easily updated every year to provide more current information that can help stakeholders understand the changing dynamics of land use, identify and mitigate emerging risks, and provide valuable information in the sustainable develop of communities, government and companies in Cambodia.

Figure 1 Stakeholders from the Cambodian Government and faculty from the Royal University of Phenom Penh at a seminar on the WESTool

Developing a tool to serve Cambodian decision-makers

Cambodia is highly vulnerable to the impacts of climate change and its deforestation rate is among the highest in the world. However, despite these known risks there is very little information on how these changes could impact the ecosystem services that the Cambodian people and economy rely on.

To best meet stakeholder needs, SFB organized a series of workshops in 2014 and 2015 that brought together national and local government, NGOs, and universities to identify what kind of information and 'tools' would be useful (Figure 1). The resulting WESTool has been presented to over 200 stakeholders, and in recognition of its utility for land use planning, the Cambodian Ministry of Environment (MoE) supported its development to assist with Environmental Impact Assessments (EIA)

HARNESSING THE DATA REVOLUTION

Every year, vast amounts of information from satellites, computer modelling, and ground research are produced. This 'data revolution' is becoming more accurate, timely, and produced at scales never before possible. Scientific studies suggest that with improved meteorological data and advances in surface hydrological modeling it is possible to provide realistic depictions of the water cycle over large scales with acceptable errors.

Harnessing and delivering this information is the challenge. These advancements are seldom presented in a manner that is meaningful and accessible to the public. The WESTool endeavors to bridge this gap by transforming datasets and analyses into a format that allows specialists and non-specialists to engage with these powerful advancements in science and research.

and their State of the Environment report.
In August 2017, SFB led two workshops in the provinces of Stung Treng and Mondulkiri to train administrators and community representatives in using the WESTool and how to integrate this information into local government planning to improve communities' resilience. These sessions emphasized practical approaches for sub-national administrators to incorporate geographically-specific WESTool data into their Commune Development Plans, which are submitted to the national government.

These Commune Development Plans are important both for local planning and for accessing funds and resources from the national government and multilateral funding. This is of particular importance because while many local decision makers are very aware of the risks posed by development and climate change, they do not have the information or resources to address these needs in their planning documents. Thus, the WESTool empowers local stakeholders by giving them access to credible data and analyses on land use change, ecosystem services, and climate change that can support efforts to improve land management, assess risks to vital ecosystem services and address issues of resilience and adaptation to climate change.

The future of the WESTool in Cambodia

In anticipation of further advancements in the research and data that underlie the WESTool, it was designed to allow for regular updates. This capacity for it to be dynamic and incorporate new and improved data will ensure it retains relevance and credibility.

WESTool will continue to be promoted and improved by Winrock under existing projects (e.g. the USAID funded Sustainable Water Partnership project). Through these projects, Winrock will work with Cambodia's Ministry of Environment, and sub-national government officials and land use managers to promote the WESTool application in EIAs and Commune Development Plans. Winrock is currently applying the WESTool to assess water security issues in the Stung Chinit watershed north of Phnom Penh.

As stakeholders gain experience and confidence in using the WESTool in their planning processes, Winrock is ready to expand its applicability and functionality to incorporate additional ecosystem services, problem domains, and economic sectors. In addition, due its adaptable design and use of globally available datasets, the WESTool can be recreated anywhere in the world, and adjusted to meet the demands of those stakeholders.