The Natural Capital Project in China

Towards harmony of people and nature through conservation of ecosystem services

China has established itself as a titan of commerce, technology, and innovation. That innovation is now spreading to broad experimentation with policies designed to safeguard ecosystem services. Rapid industrialization over the past 30 years has led the world's most populous country to unprecedented economic growth, massive advances in physical infrastructure development, and large-scale alleviation of poverty. However, many of these advances have come at the expense of China's natural capital. China's national leaders recognize that this rapid development has contributed to devastating floods, severe water shortages, desertification, and sand storms - and that China must balance economic growth with conservation to improve and sustain human well-being.

Unprecedented economic growth and 1/5 of the world's population depend on China's natural capital.

While China harbors 10% of the world's plant and animal species, it is also home to 1.3 billion people whose needs exert high pressure on resources. China is pioneering efforts to balance national economic development with conservation of biodiversity and life support systems to improve and sustain human well-being. Information on ecosystem services, values, and tradeoffs can help inform decision-makers of how alternative policy options will affect ecosystem benefits crucial to economic, health, and other dimensions of well-being. Given the scale of China's growth, its leadership in emerging environmental markets, and its pursuit of innovative solutions to environmental degradation, there is no better country in which to test and hone ways of incorporating natural capital into policy.

Since 2007, the Natural Capital Project has worked in China to help:

- **Implement** new national policy to secure natural capital and alleviate poverty through priority Ecosystem Function Conservation Areas (EFCAs), spanning 24% of the country.
- **Launch** the first-ever National Ecosystem Services Assessment that will report the status and trends of China's natural capital every decade.
- **Advance tools** for quantifying natural capital and its contribution to human well-being with the support of Chinese scientists that are experts in fields such as ecology, hydrology, demography, economics, and health.
- **Evaluate and improve** China's revolutionary policies designed to harmonize people and nature. InVEST is used to assess the biophysical and socioeconomic impacts of development policies on targeted areas and their populations.

Results

- **Collaboration with Chinese government on land-use plans based on ecosystem services.** China's Five-Year Plan for National Economic and Social Development and its national spatial plans now consider critical ecosystem service areas when designating permissible development zones.
- **Partnership with government stakeholders**, including the National Development Reform Commission, State Forestry Administration, Ministry of Environmental Protection, and the Poverty Alleviation Bureau.
- **Innovation in science and policy** through long-term collaborations with key institutes focused on quantifying natural capital, linking conservation and poverty alleviation, and improving the efficacy of national policy.
- **Mapping of critical ecosystem services in the Upper Yangtze River Basin** including water retention, erosion control, and carbon sequestration.
- **Recommending improvements** and expansions of Payment for Ecosystem Services (PES) programs across China.

NATURAL CAPITAL PROJECT:
China

China's Ecological Security

Flood and Climate Security

China has invested heavily in reforestation to mitigate flooding and climate change. Forest cover has increased more in China than in any other part of the world - by 60 million hectares over the past twenty years. Forests around China's Yangtze River Basin, pictured above, sequester an estimated 7.8 billion tons of carbon per year and shelter millions of people downstream from flooding.

Biodiversity

Biodiversity loss may be as significant an agent of ecological change as global warming. China harbors 10% of the world's plant and animal species, making its valuation of environmental services critical to global conservation.

Securing Fresh Water

Beijing's 20 million urban residents depend on surface water supplies. Watersheds filter drinking and irrigation supplies and bolster the efficiency of hydropower production by distributing water flow in rivers around the year (though most precipitation occurs over 3 months). Improving farming practices and other human activities in sensitive areas reduces risk of water shortages and contamination.

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InVEST in China

Researchers employ InVEST, a software suite developed by the Natural Capital Project, to visually map and measure ecosystem services in China. The following massive initiatives establish a new paradigm for integrating ecosystem functions such as water flow regulation, sand storm prevention, and carbon sequestration into national development planning. They are led by the Chinese Academy of Sciences' Research Center for Eco-Environmental Science (RCEES).

China's Ecosystem Function Conservation Areas

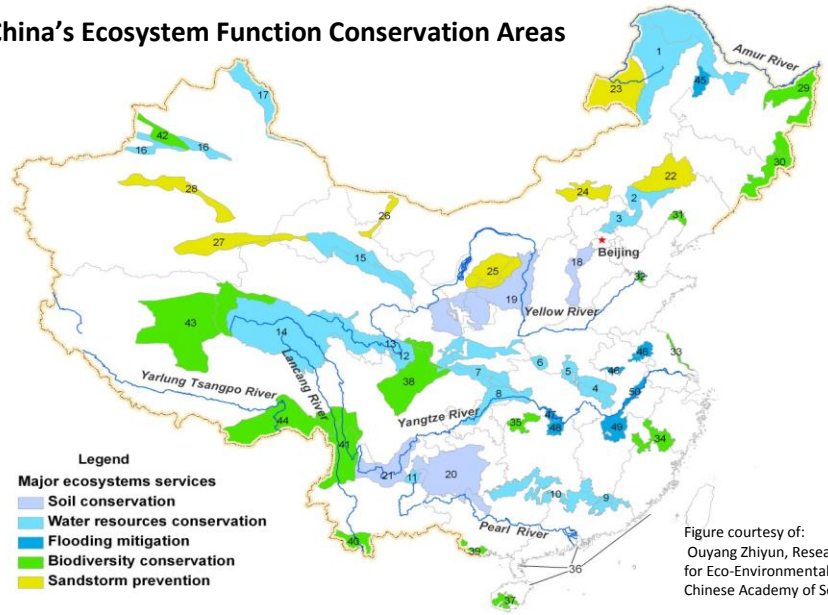

Figure courtesy of:
Ouyang Zhiyun, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences.

Ecosystem Function Conservation Areas (EFCAs)

InVEST has been used in China to implement Ecosystem Function Conservation Areas (EFCAs), spanning 24% of the country's land area. InVEST models estimate the delivery of vital services and are overlaid with biodiversity maps to target the most appropriate areas for restricted development. EFCAs are designed to secure biodiversity, soils, and water resources, and to mitigate floods and sandstorms. EFCAs also have a major goal of alleviating poverty, particularly in China's rural areas.

National Ecosystem Service Assessment

InVEST is also used for China's inaugural National Ecosystem Service Assessment, spanning a wide range of ecosystems and geographic scales, over 2000-2010. This official assessment will take place each decade to inform policy at highest levels.

Payments for Ecosystem Services (PES)

The Natural Capital Project is working to improve a PES program preserving water quality in Beijing's Miyun Reservoir, which provides over 50% of the water for the city. The program pays farmers to transition from paddy to dry-land agriculture, reducing water use and nutrient runoff. By quantifying the program's impacts on natural capital and its value, a clearer assessment of the associated costs and benefits are helping inform future management of the program.

Ecosystem-dependent livelihoods

We are also working with Xi'an Jiaotong University's Institute for Population and Development Studies to analyze how livelihoods depend on ecosystem services. Drawing from the expertise of our partners in rural demography, health and development, we are developing ways to integrate human well-being more explicitly into natural capital approaches.