

# THE ECONOMIC VALUE OF THE UPPER TUUL ECOSYSTEM



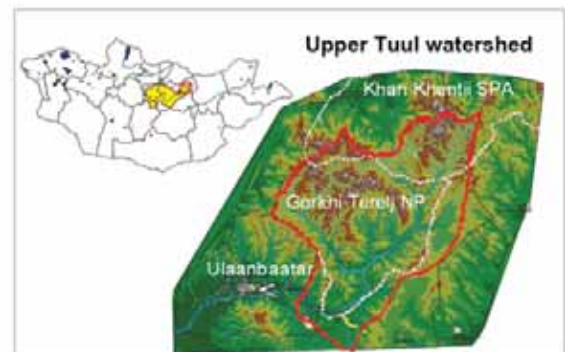
## BACKGROUND

The economic calculations which guide and influence decision-making are often incomplete or misleading. This is because they tend to exclude a series of important costs and benefits – those associated with the environment. They do not take account of the important economic values and opportunities that are gained when environmental resources are conserved and used sustainably, and they ignore the serious and wide-ranging costs that occur when the environment is degraded. In response, environmental valuation has emerged as a discipline over the last two decades. It aims to overcome these problems, and to provide more accurate information which will enable more economically and socially beneficial decision-making.

Between September 2008 and April 2009, a study was carried out under the auspices of the World Bank and the Government of Mongolia, as part of the NEMO II program. The goal of the study was to improve understanding about the economic value of the environment to Mongolia's economy, and in particular to look at the economic value of the Upper Tuul watershed. This was the first time that environmental valuation tools had been applied in Mongolia.

## STUDY AREA

While the biodiversity and ecological significance of Khan Khentii Strictly Protected Area and Gorkhi-Terelj National Park (which cover most of the 5,010 km<sup>2</sup> Upper Tuul watershed) are already recognized even at a global level, their value as economic assets is not well-understood. The study aimed to show how investments in conserving the Upper Tuul ecosystem and protected areas make good sense, not only from a biodiversity conservation point of view but also in economic and development terms.



## FINDINGS

The study found that the Upper Tuul watershed generates valuable ecosystem services, which benefit local communities, the residents of Ulaanbaatar, and even the global community. Every year, almost a million bednights are spent in the Upper Tuul, around 170 thousand hectares of land are used for grazing, and just under 8,500 cubic meters of firewood, 3,300 cubic meters of timber and 20,000 kg of fruits, berries, wild vegetables, pine nuts and medicinal plants are harvested. Unsurprisingly, the value of these land and resource uses is immense: they generate gross income in excess of Tug 28 billion a year.

Perhaps even more importantly, the protected areas safeguard the Tuul River, which feeds the aquifers which form the source of Ulaanbaatar's water supplies. More than a million people, 20,000 industries and businesses, 400 hectares of irrigated farms, 330,000 livestock and 3 power plants in Ulaanbaatar depend on water supplied from the Upper Tuul. The current value of this water is Tug 90 billion a year at a bare minimum, using very conservative estimates.

The ecological conditions in the upper watershed have a direct link to the availability of water downstream. Most basically, a healthy upstream ecosystem helps to ensure clean, regular and adequate riverflow and groundwater resources for Ulaanbaatar. Human influence is however extending into the Upper Tuul, transforming the landscape and exerting severe pressure on the natural ecosystem – and thus decreasing the ecosystem services and values it provides. The Upper Tuul watershed is under severe threat, and is being degraded as a result of unsustainable (and sometimes illegal) land and resource uses.

The study modeled the hydrological, ecological and economic effects of ecosystem change. Three ecosystem management scenarios were projected: gradual ecosystem deterioration (a continuation of the current situation), rapid resource depletion and land degradation (no protection at all), and conservation and sustainable use (improved investments in the protected areas).





It found that as the Upper Tuul ecosystem is degraded and land cover is lost, average runoff will increase and the river's mean annual maximum and low flows will become more extreme. This will result in a lowering of the groundwater table, leading to water losses. In contrast, under a scenario of conservation and sustainable use there would be no appreciable distortion of the Tuul River's base flow, and groundwater levels would not be affected significantly.

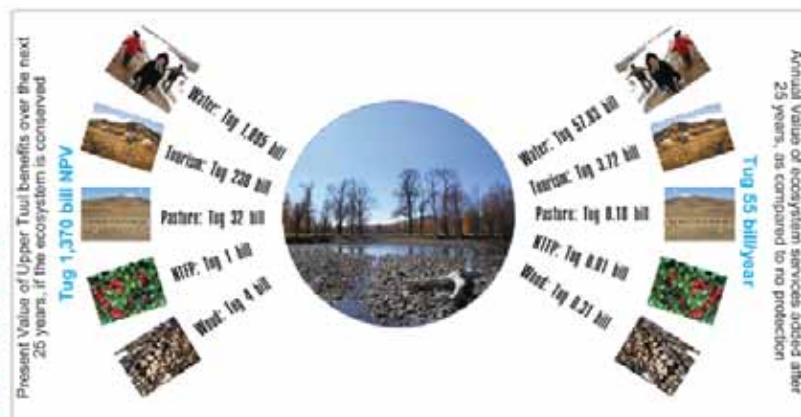
The study also found that both the economic costs of land and resource degradation and the economic benefits of conservation are significant, because of the impacts on the level of economic benefits that the ecosystem is able to generate for upstream land and resource users and downstream water users. Conserving and sustainably using the Upper Tuul watershed has the potential to generate water, tourism, herding and forest product values over the next 25 years with a Total Present Value of Tug 1,370 billion. By the end of the period modeled, conservation will be generating ecosystem services worth Tug 55 billion a year more than would be the case if the Upper Tuul were not protected.

## RECOMMENDATIONS

The findings of the study suggest three important action points for policy-making and decision-making.

The first is that rather than being just a biological or ecological concern, ecosystem degradation also has serious economic and development consequences. The study findings show that if the Upper Tuul ecosystem continues to be degraded, the loss of water, pasture and forest product values will cost the Mongolian economy a total of between Tug 400 billion and Tug 655 billion over the next 25 years.

The second is that there is a strong economic rationale to investing in ecosystem conservation. The study findings show that every Tug 1 invested in conservation has the potential to generate economic benefits of more than Tug 400 each year. However, Khan Khentii Strictly Protected Area and Gorkhi-Terelj National Park currently receive budget allocations that are far too low to enable even basic conservation and management activities, and which are disproportionately low compared with the benefits that they generate. There is an urgent need to ensure that sufficient funds are allocated to managing the protected areas.



Third is that, at least over the short term, most land and resource users in the Upper Tuul can generate more income from continuing their activities at unsustainable levels – even if, over the long-run, these values will decline. For the case of tourism, serious efforts need to be made to regulate activities if the ecosystem is to be conserved. Although it is clearly in the broader public interest to conserve the Upper Tuul ecosystem, it is not in the immediate financial interests of the people who use its land and resources.

This, then, becomes a key challenge: to set in place sufficient incentives to enable land and resource users in the Upper Tuul to gain in economic and financial terms from limiting their land and resource uses to sustainable levels.

Emerton, L., and E. Bos, E. (2004) VALUE: Counting Ecosystems as Water Infrastructure, IUCN – The World Conservation Union, Gland. This document explains the background to ecosystem valuation (especially for water services), and goes through the different methods and tools that can be used to value ecosystems. <http://data.iucn.org/dlbtw/wpd/edocs/2004-046.pdf>

European Community. 2008. The Economics of Ecosystems and Biodiversity. An Interim Report. European Community, Brussels. This recent document reports on a study the economic significance of the global loss of biodiversity, carried out as part of the "Potsdam Initiative" on biodiversity (which resulted from the March 2007 meeting of G8+5 Environment Ministers). [http://ec.europa.eu/environment/nature/biodiversity/economics/pdf/teeb\\_report.pdf](http://ec.europa.eu/environment/nature/biodiversity/economics/pdf/teeb_report.pdf)

World Bank et al. 2004. How Much Is an Ecosystem Worth? Assessing the Economic Value of Conservation. International Union for Conservation of Nature (IUCN), The Nature Conservancy (TNC) and the World Bank. This paper seeks to clarify how valuation should be conducted to answer specific policy questions. [http://www.wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2004/12/07/00012009\\_20041207120119/Rendered/PDF/308930PAPER0Ecosystem0worth01public1.pdf](http://www.wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2004/12/07/00012009_20041207120119/Rendered/PDF/308930PAPER0Ecosystem0worth01public1.pdf)

