

The background features a large, stylized graphic in shades of green and white. The graphic consists of several overlapping, curved shapes that resemble the veins and edges of a leaf or a plant branch. The colors are a vibrant green and a clean white, creating a high-contrast, modern aesthetic.

**How large are Your Returns
on conservation investment?**

Introduction

Conservation's public benefits – e.g., food, wood, clean water, energy, protection from soil erosion and floods – are not valued. Instead, prices are assigned to those goods and services whose production results in ecosystem damage.

Consequently, local authorities and central planners in Pakistan have begun to commission “economic valuation studies” intended to monetize ecosystem services. The results of the studies are expected to help, among others, to:

- Assess the costs of environmental degradation
- Carry out benefit cost analyses
- Determine and justify budgetary allocations to environmental sectors

This brief has been designed to bridge the different initiatives taken by WWF-P and other stakeholders in the realm of monetizing ecosystems and environmental resources. It is meant to be a tool for decision-makers in government, local authorities, and civil society organizations to develop, adopt and promote policies, strategies and practices to effectively manage and utilize environmental resources.

Explore Further

Dehlavi A., Groom B., Khan B.N. and A. Shahab. 2008. "Total Economic Value of Wetland Sites on the Indus River." World Wide Fund for Nature - Pakistan (WWF-P), Lahore.

Dehlavi A., Groom B., Khan B.N. and A. Shahab. 2010. "Non-use Values of Ecosystems Dependent on the Indus River, Pakistan: a Spatially Explicit, Multi-ecosystem Choice Experiment," In Choice Experiments in Developing Countries: Implementation, Challenges and Policy Implications. Bennett J. and E. Birol (eds). Edward Elgar, Washington D.C., USA. See: http://www.e-elgar.co.uk/Bookentry_contents.lasso?id=13208

Dehlavi A. and I. H. Adil. 2010. "Valuing Recreational Use of Pakistan's Wetlands: Application of a Count Data Model to the Travel Cost Method". Forthcoming as a South Asian Network for Development and Environmental Economics (SANDEE) working paper.

IUCN. 2007. "Are the Mangroves for the Future? Empirical evidence of the Miani Hor Mangrove Ecosystem as the basis for investments". IUCN - Pakistan. Authors: Baig S. P. and U.A. Iftikhar.

Khan H. 2004. "Demand for Eco-tourism: Estimating Recreational Benefits from the Margalla Hills National Park in Northern Pakistan", SANDEE working paper no. 5-04

World Bank. 2006. "Pakistan Strategic Country Environmental Assessment". South Asia Environment and Social Development Unit. Washington D.C.

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Pakistan's Store of Valuation Studies

According to a World Bank (2006) economic valuation study, the cost of environmental degradation in Pakistan is Rs. 1.5 billion per day (inflation-adjusted 2010 value). These costs relate to the loss of rangeland and forest ecosystems, together with soil salinity, soil erosion, water, urban air, and airborne lead and indoor air pollution.

The World Bank study was extremely useful in terms of popularizing the idea that environmental degradation has monetary costs, which are borne by the economy and also tax payers. A WWF-P (2008) economic valuation study exceeds the policy applicability of the World Bank (2006) study. Unlike the former study, it is based on primary data, covers non-use values, and contains highly pertinent estimates such as those relating to forest carbon sequestration and water supply to Karachi. It is the only other study, to date, whose results are instantly applicable to benefit cost analysis, but also budgetary allocation decision-making (see table 1).

Table 1:
Ecosystem Values
(Present Value, Rs. Billion)

2010 April	DUV	IUV	NUV	TEV
Deltaic (Keti Bunder)	9.8	0.8	0.4	11
Rangeland (Chotiari)	2.7	-	2.7	5
Freshwater (Keenjhar)	3.9	7.6	0.4	12
Forest (Pai)	0.9	0.1	2.0	28
Agriculture (Pai)	25.1	-		
Total	42.3	8.4	5.5	56

Source: inflation adjusted figures based on WWF 2008
(All values calculated using a 10% discount rate; assumes a limitless time horizon.)

As per table 1, only a total economic value (TEV) estimate – i.e., one covering at once the direct use (DUV), indirect use (IUV) and non-use (NUV) values of a given ecosystem – is policy relevant. Note that values in table 1 need to be adjusted before being interpreted, among others by determining per hectare values, and selecting discount rates and time horizon assumptions to allow comparison and use.

Note that for table 1, the assumption for the net present value (NPV) calculation is an infinite time horizon. That is, it is assumed that the benefits described, e.g., fish catch, are sustainable. Suppose we assume these benefits exist for only 50 years, then with a 10% discount rate the NPV is little affected. These values are obviously sensitive to the discount rate. For instance, if discount rates are assumed to be 20%, this would half the NPV. In table 1 the 10% discount rate is used because this corresponds to the average yield of the 6-month Treasury Bill (T-Bill) for the past 15-20 years (about 10% between March 1991 and April 2009). This is a conservative benchmark for the time value of money in Pakistan. Pakistan Investment Bonds (PIBs) probably would have been better instruments than 6-month T-Bills to obtain average yields from for this purpose, but data are available only from 2001 onwards. A sensitivity analysis (for discount rates of 1%, 5%, 10%, 15%, and 20%) are presented in Dehlavi et al. (2008).

Another important point to note for table 1 is that the numbers presented are annual means from the authors' cluster sampling procedure. In the case of the Keti Bunder DUV figure in table 1, the associated standard errors lead to a 95% confidence interval ranging from 303,569,915 to 1,176,928,997. This means that gross margins in Keti Bunder are significantly different from zero. Only estimates which were significantly different from zero were included while calculating the total annual benefit values. Similar interval estimators exist for all the sites in Dehlavi et al. (2008).

A recent WWF-P study (Dehlavi et al., 2010), a spinoff from the TEV estimates of forest, freshwater, rangeland, coastal, and agricultural ecosystems undertaken in 2008, examines NUV only. This rare and well executed application of “choice experiment” methodology earned WWF-P a chapter in a book on best practices edited by world authorities in this field.

(Please see:
http://www.e-elgar.co.uk/bookentry_main.lasso?id=13208).

Another partial study, based on a grant from the prestigious South Asian Network for Development and Environmental Economics (SANDEE), is a WWF-P study (Dehlavi and Adil, 2010) of the DUV associated with tourism at Keenjhar Lake. It succeeds in augmenting the existing fisheries based DUV (see table 1), slightly overtaking it, understandably, since tourist visitation is high and certainly earns more than fisheries.

Other partial studies exist, e.g., an IUCN (2007) “rapid ecological-socio-economic assessment” of mangroves, or, a DUV of Margalla Hills National Park, by Khan (2004), also based on a SANDEE grant. Besides a handful of upcoming SANDEE studies, on livelihood impacts of tourism at Keenjhar, or, externalities from open-sewerage systems in Rawalpindi, all other known applications of valuation techniques are non-environmental.

Finally, a WWF-P (2010c) set of national guidelines, intended for users conducting and overseeing forest valuation studies, is now available. The guidelines were commissioned by the Ministry of Environment and the National Forest Programme (NFP) Facility, with financial support from the Food and Agriculture Organization of the United Nations (FAO). The guidelines are expected to kick-off the training of line officials in environment, economic, and resource ministries (who would oversee the studies), the commissioning of TEV studies for all 10 forest types in Pakistan, and use of the studies to justify increased afforestation reforestation allocations.

How to Include Ecosystem Services in National Policy

In practice, how does one include ecosystem services into national policy? This refers to more precise inventorying of natural resources, assessments of costs of environmental degradation in terms of health or foregone incomes, but also use of TEV study results to argue for increased allocations to environmental sectors.

The current system awards budgets based on a given sector's share to gross domestic product and cannot be said to be the result of consultation among environment, economic, and resource ministries. An urgent overhaul of the old system is needed since it privileges goods and services production through land uses that fragment habitats and cause ecosystem damage.

The notion of man-made and natural capital management based on actuality must take into account concrete linkages between fiscal policy, monetary policy, industrial and natural resource extraction policies, the patterns of use of natural resources, and broader factors of national welfare.

These linkages can be made when the flows of services to people from ecosystems are monetized (both marketed and non-marketed service flows such as flood protection), and that the results of such valuation studies are embedded within policy directives to achieve efficiency.

The Ministry of Environment and the National Forest Programme Facility have already taken a groundbreaking step in this direction by commissioning a set of national guidelines to assist statisticians and resource economists, among others, in conducting and overseeing forest valuation studies.

The journey is not a difficult one. In fact, it can be approached through a series of simple steps, as described in the box- 1.

The first step is to agree that monetization of the environment and environmental services is a necessary step in order to manage and improve resource allocation to the environment sector.

Box 1:

Six Steps for Including Ecosystem Services in National Policy

Steps	Strategies and Tools
Step 1: Specify and agree on the policy issue with stakeholders	This ensures that all important aspects are being considered and avoids misunderstandings during decision-making and implementation. <ul style="list-style-type: none">• Stakeholder analysis and policy appraisal• Use management frameworks to mainstream concern for ecosystem services in economic policy and planning

Steps	Strategies and Tools
<p>Step 2:</p> <p>Identify which services are most relevant</p>	<p>Appraise and prioritize important ecosystems and their services.</p> <ul style="list-style-type: none"> • Which ecosystems and services are central • Who depends on them most • Which services are at risk • How do policies affect them
<p>Step 3:</p> <p>Oversee information needs and selection of appropriate methods</p>	<p>Determine what kind of information on ecosystems and ecosystem services are needed.</p> <ul style="list-style-type: none"> • Qualitative description • Biophysical quantification • Monetary valuation
<p>Step 4:</p> <p>Have ecosystem services assessed</p>	<p>Commission and oversee ecosystem assessments, including through economic valuation studies.</p> <ul style="list-style-type: none"> • Instruments for valuing ecosystem services – e.g., rapid ecological assessment, total economic valuation study, and, environmental impact assessment; • Spatial and resource specific planning databases, manuals, and tools to support the assessment studies.
<p>Step 5:</p> <p>Identify and appraise policy options</p>	<p>Insights from the assessments feed into policy in a variety of ways:</p> <ul style="list-style-type: none"> • Informs debate • Provides the basis for a cost-benefit analysis • Serves as justification for increased budgetary allocations to environment sectors
<p>Step 6:</p> <p>Oversee assessment of distributional impacts</p>	<p>Disseminate findings regarding changes in availability of ecosystem services and their effects on people according to their dependence. Options for anticipating these changes include:</p> <ul style="list-style-type: none"> • Poverty assessment tools • Sustainable livelihoods assessment

Once this consensus has emerged, the lead ministry i.e. the Ministry of Environment etc. in consultation with experts, civil society and other partners undertakes step 2 by identifying important services in order of priority. Consulting a broad spectrum of stakeholders will allow for a richer and more complete perspective.

Steps 3 and 4 describe the process involved outsourcing the studies to competent persons and groups including identifying information needs and the on-ground valuing of ecosystem services. Once these studies and assessments have been completed, step 5 identifies the various ways the results of these studies may be used to inform policy directives, decisions surrounding resource allocation and investment in natural capital, strategic utilization of conservation benefits, or encourage provincial and district governments to use these findings to guide their planning and investment priorities. Finally, the results of these studies, actionable findings, and associated policy formulations must be communicated to the necessary provincial and district line departments in order to shape current and future planning.

Source: adapted from TEEB (2010) “A Quick Guide to the Economics of Ecosystems and Biodiversity for Local and Regional Policy Makers”.



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