

Economic Valuation in Western Africa

Executive summary

[to be written last]

1. Introduction*

Think of a forest ecosystem in West Africa - a rainforest, a moist mountain forest, a dryland forest, a coastal mangrove forest. What benefits does this forest generate and to whom? Are these benefits and the distribution of these benefits sufficient to ensure that the forest will be conserved?

Economic valuation is one of the tools we can use to assess the benefits of ecosystem conservation as well as how these benefits are distributed among the stakeholders. Through an analysis of benefits and costs, we can begin to understand some of the forces which may be threatening the existence of forests and other ecosystems.

Think of a forest ecosystem as a business. Who are its customers? What goods and services are they interested in? Or, perhaps, are they only interested in the land resources under the forest, such as cleared land for farming or the minerals under the ground? These interests may threaten the ecosystem. An economic or business approach to ecosystem management uses economic valuation as a practical tool to assess potential benefits and costs and to identify potential customers and threats.

Think of local communities as customers. What goods and services do they want from the forest? Timber for building material? Timber to convert into charcoal for fuel? Non-timber products such as fruits and honey? Medicinal plants? Thatching grasses? Do they want access to lands for grazing their livestock or access to watering holes during the dry season? How can we develop a profitable, sustainable relationship between the forest and its neighbours? Can

* This section and the following section draw on previous work of IUCN on environmental valuation, notably the IUCN WCPA guide to valuing protected areas. This document and many other relevant documents can be found on the website associated with this report: <http://earthmind.net/values>.

the local communities pay in cash or in kind for the goods and services they receive from the forest?

Or, as may be the case, think of the local communities as a threat. Their interest in the land for farming and ranching may far outweigh their interest in keeping the forest conserved. If they are to see the forest as a benefit, it must be a tangible benefit to them. How can we involve the local communities meaningfully in the business of conserving the forest? Do we offer them employment opportunities? Compensation for the lack of exploitative access? Do we make them co-managers of the forest by bringing them into an forest ecosystem management business as partners or even as shareholders?

A major threat to conserving ecosystems, including forest, savannah, wetland and marine systems, is the demand to use the land for agricultural or ranching purposes. By identifying the benefits and costs facing local communities from conserving the forest, we will be better able to minimize the threats to and increase the tangible returns from forest conservation.

In addition to local community customers, think of the actual and potential commercial customers. What goods and services can be harvested sustainably from the forest and sold on the open market? Timber, of course, is a major product. Can we earn a fair rent from timber for forest conservation? Is the timber being harvested sustainably? What about commercial sales of non-timber forest products, including medicinal plants, honey and bush meat? Does the forest offer opportunities for tourism or hunting? Also, are there opportunities for bio-prospecting? Can we commercialize access to genetic resources in a way which promotes ecosystem conservation and equitable sharing of the benefits?

Valuation techniques can be used to assess the benefits of direct uses—both consumptive and non-consumptive uses—of the forest. These include assessing the direct commercial or market value of such uses as well as the broader impact of these uses on local and national economies—what economists call the multiplier effects.

How do we address illegal markets for forest products, such as illegal timber trade, as well as trade in threatened and endangered species? These illegal markets are servicing some customers of the forest as well as generating economic benefits. If illegal markets

exist, the good news is that there are at least some customers for forest products.

The bad news, of course, is that these markets may undermine forest conservation. Illegal markets probably do not promote sustainable use, and the benefits they generate probably are not equitably shared. This poses a serious challenge to an ecosystem with illegal, but active markets for its products. Is it better to invest resources in closing down this trade and keeping it closed, or in making it legal and attempting to manage it sustainably?

Because illegal markets are difficult to monitor, detailed valuation studies may not be possible. Nevertheless, estimates of the value of illegal trade in forest products can indicate the size of the markets and thus the extent of the problem. Such estimates can assist forest managers and policy-makers decide how to deal with this trade.

We also need to consider the “downstream” or indirect customers of the natural forest. What benefits accrue to more distant communities and more generally to the entire country? A good example is watershed services. If the forest serves as a watershed, it provides benefits to downstream water users including farmers, ranchers, and villagers. The activities of these groups in turn contribute to national economic development. The forest ecosystem may also be a habitat for plants and birds which have value in other parts of the country. Still other indirect benefits might include the cultural or spiritual values of the forest.

Such downstream benefits may be difficult to commercialize. The transaction costs of charging separate fees to each customer for each indirect service would be prohibitive. Thus the forest’s managers might consider approaching the national or provincial government directly not for a subsidy, but for a payment for services rendered to the broader society. Here valuation studies can be used to assist in quantifying the indirect benefits of the forest to provincial or national economies, and thus can be used to determine the appropriate level of payment for these services.

Finally, we also need to consider the global customers for the forest. Within the mandates of global environmental agreements, the forest clearly provides at least two global services: biodiversity conservation and carbon sequestration. Again, valuation studies, such as contingent valuation surveys to estimate the existence

value of forests and other ecosystems, can be used to estimate the global benefits arising from conserving the forest. With the absence of markets for such global benefits, such valuation techniques, as imprecise as they are, provide at least a rough estimate of the level of benefits generated.

The principles of the Convention on Biological Diversity are that conservation of a forest ecosystem will involve sustainable use of forest resources as well as equitable sharing of the benefits that arise from use of these resources. If the forest is to be conserved, however, there must also be sustainable financing of the forest management, as well as the equitable sharing of the costs of conserving the forest.

Conservation generates both benefits and costs. If the costs are not addressed and sufficiently covered, the benefits will be lost. Costs can and should be recovered from those who use the forest, whether at local, provincial, national or global levels, and whether through local community, governmental or commercial channels.

It is, of course, not necessary to capture all the values or “economic surplus” generated by conserving the forest. The financial objective should be to capture sufficient revenues, including reserves for economic down times, to ensure that the forest will be conserved. In this respect, economic valuation can be used a tool to ensure the financial sustainability of the forest.

But what if a forest ecosystem appears to have an insufficient customer base? Or what if the opportunity costs of conservation—i.e. the benefits which would accrue from replacing the forest with other land uses such as farming or mining—bring about strong pressures to clear the forest? In such cases, the forest’s managers will have to focus their efforts on marketing conservation and conservation-compatible goods and services as a sustainable development business.

From the perspective of global environmental agreements, however, it is highly unlikely that the global customer base will be insufficient. Nevertheless, global customers may not be in a position to pay for the benefits they receive in a manner which will provide the appropriate incentives for the managers of the forest, as well as for those who desire to clear the forest, to conserve it. Thus valuation studies can also be used as a marketing tool to help raise additional revenues internationally. Also, valuation studies

can also be used as a policy tool to encourage institutional reform which will enable the forest managers to generate sufficient revenues from its broad customer base to make this forest financially sustainable.

Think of a forest ecosystem in West Africa or of a marine ecosystem or a dryland ecosystem. This report provides an overview of how environmental valuation studies are and could be used to support the sustainable and equitable management of ecosystems in West Africa.

2. Valuation and decision-making

Identifying and quantifying the value of an environmental asset such as a forest ecosystem can be interesting intellectual exercise for an academic environmental economist. Without a framework which embeds the valuation in a broader context, however, the process can be of little use to decision-makers.

A structured valuation process is needed to gives purpose and direction to a valuation study. It will also probably save time and money in the end. Such a process identifies what the valuation study will be used for, which values are important to quantify, and which valuation techniques are most practical. If a valuation study is to be useful to decision makers it must include three initial steps:

- Defining the users of the study;
- Determining the scope of the study; and
- Choosing the appropriate valuation techniques.

Before starting a valuation study, most importantly, the end users of the study should be clearly identified. Establishing the intended use of the valuation study gives the study a *raison d'être*, enables it to be carried out more efficiently and effectively, and helps to ensure that the valuation is relevant and clear to those who need the information.

As highlighted in the Introduction, there are many different types of values which can be associated with many different issues. For examples, decisions may need to be made about:

- Designing and carrying out projects in or adjacent to protected areas;

- Designing and carrying out projects which use natural resources or services;
- Designing and carrying out projects upstream or downstream from conservation areas;
- Establishing and implementing rural development programmes relating to local environmental assets;
- Establishing and implementing policies for ecosystem management;
- Establishing and implementing policies for financing environmental protection; and
- Designing strategic environmental plans at local, national and international levels.

Such decisions could be made by a variety of decision makers such as:

- Protected area managers;
- Local community leaders;
- Elected government officials;
- Economic development ministries;
- Private companies and land owners;
- Labour union representatives;
- Multilateral and bilateral donor agencies; and
- Environmental and development NGO.

Clarity about the type of decisions which need to be made and the nature of the decision-making groups will help to determine which values need to be quantified and how those studies need to be expressed. For instance, a decision about carrying out a construction project adjacent to a protected area requires information about a set of values different from those needed for a decision about how much global funding to seek in support of maintaining large marine ecosystem. Additionally, the people involved in the public enquiry of the construction project will probably need the valuation information presented in a manner different from a Ministry of Finance or the World Bank.

The perspectives of the relevant decision-makers will also influence what is considered a benefit and what is a cost. One group's costs may be another group's benefits. In some cases it may be necessary for an ecosystem manager to represent what is a 'cost' to one group as a benefit to another group. For example, taxpayers may view

civil service jobs as a cost while local communities and labour unions may view these jobs as a benefit.

In an October 2004 World Bank paper, Stefano Pagiola, Konrad von Ritter and Joshua Bishop focus on four important uses of valuation studies all of which have direct relevance to West Africa. These are:

- **“Determining the value of the total flow of benefits from ecosystems.** This question typically arises in a ‘national accounts’ context: How much are ecosystems contributing to economic activity? It is most often asked at the national level, but can also be asked at the global, regional, or local level.
- **“Determining the net benefits of interventions that alter ecosystem conditions.** This question typically arises in a project or policy context: Would the benefits of a given conservation investment, regulation, or incentive justify its costs? It differs fundamentally from the previous question in that it asks about *changes* in flows of costs and benefits, rather than the sum total value of flows.
- **“Examining how the costs and benefits of ecosystems are distributed.** Different stakeholder groups often perceive very different costs and benefits from ecosystems. Understanding the magnitude and mix of net benefits received by particular groups is important for two reasons. From a practical perspective, groups that stand to ‘lose’ from conservation may seek to undermine it. Understanding which groups are motivated to conserve or destroy an ecosystem, and why, can help to design more effective approaches to conservation. From an equity perspective, the impact of conservation on particular groups such as the poor, or indigenous peoples, is also often of significant concern in and of itself.
- **“Identifying potential financing sources for conservation.** Knowing that ecosystem services are valuable is of little use if it does not lead to real investments in conserving the natural ecosystems that provide them. Simply knowing that a protected area provides valuable watershed protection benefits, for example, does not pay the salaries of park rangers. Yet experience has shown that relying solely on government budget allocations or external donors for the necessary funding is risky.

Valuation can help identify the main beneficiaries of conservation and the magnitude of the benefits they receive, and thus help design mechanisms to capture some of these benefits and make them available for conservation."

The World Bank paper summarises these approaches and how they are addressed by valuation studies as follows:

Table 8.1: Approaches to valuation Approach	Why do we do it?	How do we do it?
Determining the total value of the current flow of benefits from an ecosystem	To understand the contribution that ecosystems make to society	Identify all mutually-compatible services provided; measure the quantity of each service provided; multiply by the value of each service
Determining the net benefits of an intervention that alters ecosystem conditions	To assess whether the intervention is economically worthwhile	Measure how the quantity of each service would <i>change</i> as a result of the intervention, as compared to their quantity without the intervention; multiply by the marginal value of each service
Examining how the costs and benefits of an ecosystem (or an intervention) are distributed	To identify winners and losers, for equity and practical reasons	Identify relevant stakeholder groups; determine which specific services they use and the value of those services to that group (or changes in values resulting from an intervention)
Identifying potential financing sources for conservation	To help make conservation financially sustainable	Identify groups that receive large benefit flows, from which funds could be extracted using various mechanisms

In short, for valuation studies to be useful, it is important to identify what specific information is needed and by whom.

3. Valuation methodologies

3.1. Categories of value

Identifying an ecosystem's goods and services, determining who values those goods and services, and measuring these values is not

always a easy and straightforward process. The goods and services may tourism, hunting, timber, wild harvesting, wildlife habitat, watersheds, carbon sequestration, and genetic materials. Many of these goods and services may not be traded in open, commercial markets and therefore do not have market values.

The concept of total economic value is now a well-established and useful framework for identifying various environmental values. The total economic value of an environmental asset such as a forest ecosystem consists of both its use values and its non-use values. The ecosystem's use values in turn are made up of its direct use values, its indirect use values, and its option values. The ecosystems non-use values include its bequest values and its existence values. These are can be shown schematically as follows:

- TOTAL ECONOMIC VALUE = USE VALUES + NON-USE VALUES
- USE VALUES = DIRECT USE VALUES + INDIRECT USE VALUES + OPTION VALUES
- NON-USE VALUES = EXISTENCE VALUES + BEQUEST VALUES

Direct use values are derived from direct use activities such as tourism, natural resource harvesting, and hunting. In some cases, these activities can be traded on a market and thus have a market value. In some case, such as collecting fuel wood and grazing livestock by local communities, the direct use may be not be traded in markets and so the values will need to be estimated.

Indirect use values are derived from indirect uses such as watershed protection, climatic stabilisation and carbon sequestration. Other indirect natural services include habitats for insects which pollinate local crops or for raptors which control rodent populations. Indirect use values are often widely dispersed and rarely traded in open markets.

Option values are derived from the option of using an environmental asset sometime in the future. These future uses may be either direct or indirect and may include the future value of environmental information. Future environmental information is often cited as particularly important for biodiversity as untested genes may provide future inputs into agricultural, pharmaceutical or cosmetic products.

Non-use values are values Two common types of non-use values are bequest values and existence values.

Bequest values are a type of non-use value which people have for an environmental asset. It refers to the value derived from knowing that others benefit from an environmental asset.

Existence values are another type of non-use value which refers to reflect the value of knowing that an environmental asset, such as a tropical rainforest, exists even though one is unlikely to visit it or use it in any other way. Though significant in many case, such values are particularly difficult to quantify.

Though terminology varies somewhat, valuation studies generally attempt to quantify use values and non-use values, especially those values which are not trade in open markets. A typical presentation on valuation categories - this one on protected areas - follows:

Box 4. Total economic values of protected areas				
Use values			Non-use values	
Direct use value	Indirect use value	Option value	Bequest values	Existence values
<i>Recreation</i>	<i>Ecosystem services</i>	Future information	Use and non-use values for legacy	<i>Biodiversity</i>
<i>Sustainable harvesting</i>	<i>Climate stabilisation</i>	Future uses (indirect and direct)		Ritual or spiritual values
Wildlife harvesting	<i>Flood control</i>			Culture, heritage
Fuel-wood	Ground-water recharge			Community values
Grazing	<i>Carbon sequestration</i>			Landscape
Agriculture	Habitat			
Gene harvesting	Nutrient retention			
Education	Natural disaster prevention			
Research	<i>Watershed protection</i>			
	Natural services			

Source: Adapted from Barbier et al., (1997)

3.2. Valuation methods

Environmental economists have developed a portfolio of techniques for quantifying various types of value. This section highlights describes some of the more common techniques.

Market-based valuation quantifies the value of environmental goods and services traded in open commercial markets. This is relatively straightforward because the markets have already done the work of eliciting values from environmental consumers. For example, the direct use values of environmental tourism could be measured through the direct sales to tourists which may include expenditures on lodging and meals, entrance fees, concessions, rentals, guides and so on. Another example is the emerging markets for ecosystem goods and services such as carbon sequestration or watershed protection.

Contingent valuation quantifies the value of an environmental good or service by asking people what they are willing to pay for it or willing to accept for its loss. Though not without controversy, the concepts of “willingness to pay” and “willingness to accept” are used to estimate values where markets do not exist, such as existence values, option values, indirect use values and non-use values.

Hedonic pricing uses existing markets - such as the property or labour markets - to determine the value of an environmental good or service. This approach quantifies the component of a property’s price or a worker’s wage wages attributable to the environmental good or service. Hedonic pricing can also be used to value environmental damages, and their effects on property prices or wages.

Travel costs also uses existing markets to determine the value of an environmental asset from estimating the costs incurred travelling to the environmental asset in terms of time, travel expenditures and entry fees. Travel cost methods are particularly useful for assessing the non-commercial tourism values of a protected area.

Changes in productivity can be used to estimate the change in the value of production of a good or service that occurs as a result of the change in land use. For example, a protected forested area may be being considered for a clear-cutting operation. As it stands, the forest provides a watershed service to farmers downstream. The change in land use would result in a change in productivity of

the farmers which could be estimated as an indicator of the value of the forest's watershed service.

Loss (or gain) of earnings evaluate the change in human productivity resulting from environmental deterioration or improvement. For example, if water quality improvements reduce the levels of disease resulting from poor water quality, then the gain of earnings can be used to estimate the value of clean water.

Opportunity costs provide an estimate of the value of a natural ecosystem based on the foregone income of the next best alternative use of the area. Measuring the opportunity cost of the protected area, for example, can give the manager an idea of the competitive threats to the area. In the case of potential threats from people living adjacent to a protected area, the relevant opportunity costs will be the value of alternative land uses they may prefer, such as farming or ranching. Other interest in the area may come from pressures for industrial or urban development, mining or intensely modified recreation uses.

Replacement costs can be used to measure the cost of damage done to ecosystem by estimating the cost of replacing the damaged environmental assets. If replacement costs exceed prevention costs, then the damage should be avoided.

4. Use of valuation in Western Africa

This section of the report reports on the key findings and recommendations of valuation case studies from Western Africa. Though far too few environment valuation studies have been undertaken in the region, those that have been done clearly demonstrate the usefulness of valuation studies to sustainable development.

- Cameroon

Feasibility study on financing mechanism for conservation and sustainable management of central African forests

by Melissa Moye and Brigitte Carr-Dirick, 2002

The study was prepared at the request of the ministers in charge of forests of central Africa (COMIFAC). It analyses opportunities and constraints for introducing new financial mechanisms. The key findings and recommendations were:

“that sustainable financing for Central African forests will require the combined implementation of an ensemble of financing mechanisms, rather than the introduction of a single mechanism, such as a sub-regional trust fund. ...

“Raising new sources of funding will also be contingent on the governments of the sub-region showing their commitment to the Yaoundé Declaration by consecrating the budgetary resources needed to implement priority actions. In addition, the effectiveness of many of the financing mechanisms will largely depend on the sub-region’s improvement of its “brand image” in terms of governance as well as the presence of a climate and institutional setting favorable to private sector investment.”

Waza Logone floodplain, Cameroon: Economic benefits of wetland restoration.

by Lucy Emerton, 2003

This study describes an exercise undertaken to assess the economic effects of floodplain degradation in the Waza Logone region of Cameroon. It presents an economic justification for government and donor investment in flood release measures to restore the hydrology and biodiversity of the floodplain. The key findings and recommendations were as follows:

“The results of the valuation study both presented a convincing argument for investment in flood release measures in the Waza Logone floodplain as a mechanism for rural poverty alleviation and sustainable livelihood development, and also highlighted the high economic costs to poor rural populations of having failed to take environmental values into account when the original investment in the SEMRY irrigation scheme was made.”

- **Nigeria**

The economic importance of wild resources in the Hadejia-Nguru wetlands in Nigeria

by Derek Eaton and Marie-Thérèse Sarch, 1997

This study presents the results of a training workshop and field study undertaken to assess the economic importance of the major wild resources harvested within the wetlands using participatory

appraisal techniques. The key findings and recommendations focus on the applicability of valuation studies in the region:

“The study confirmed that participatory research techniques can be used to investigate both relative and absolute economic values, although, there are limitations to the use of collecting absolute quantities for aggregation and scaling up over a wide area. Nonetheless, increased understanding of the economic importance of wild resources provides useful and timely information with which the HNWCP will be able to reinforce its important policy recommendations on the necessity of maintaining regular flooding of the Wetlands.”

- Senegal

The economic value of wild resources in Senegal
by Cheikh Oumar Ba et al, 2003

This draft report presents a summary of findings of recent research on the value of non-timber forest products, game, and freshwater fisheries in Senegal, West Africa. The research is based on new data gathered from producers, traders, and consumers of wild plant and animal products. The key results and recommendations of this large research initiative are as follows:

“The research carried out by IUCN and its partners in Senegal ... has provided significant new information on the production, trade and consumption of non-timber forest products, game and freshwater fisheries. A major new dataset has been developed, which is beginning to provide important insights into the economic importance of wild resources.

“Further dissemination and analysis of the data can help guide policy reforms and investment proposals, for more productive and sustainable use of wild resources in Senegal and other countries of the region. A priority for research and policy analysis is to explore the role of wild resources in new strategies for poverty reduction.”

Summary of the Djoudj and Diawling valuation studies
by Oumou Koulsoum Ly et al, 2003

This document is a summary in French of the results of the valuation studies of the Djoudj and Diawling National Parks. Beyond

their impact on fauna and the flora, the restoration, installation and management projects of these national parks improved visibly the social conditions of the local populations and strongly favoured the development of many economic activities in the delta of the Senegal River.

The draft report of the valuation study of Djoudj National Park
by Oumou Koulsoum Ly et al, 2003

The key results and recommendations of this draft study in French are (a) to consider all the "political" implications emanating from the results, (b) make clear recommendations on the options of development of tourism and (c) work out arguments of negotiation in favour of the conservation.

The draft report of the valuation study of Diawling National Park
(by Oumou Koulsoum Ly et al, 2003)

The key results and recommendations of this draft study in French include the observation that the resumption of the activities of fishing, craft industry, gathering and the improvement of the profitability of the truck farming and the breeding are due mainly to the effort of restoration of the system of the floods which constitutes the indispensable condition of the ecological balance of the zone.

Theorizing access: Forest profits along Senegal's charcoal commodity chain
by Jess Ribot, 1997

This study examines the distribution of benefits from Senegal's charcoal trade and the multiple market mechanisms underpinning that distribution. Key findings and recommendations were as follows:

"There is not just one 'market mechanism', rather there is a whole array of mechanisms integral to production and trade."

"Both the formal and informal market-state relations shape the implementation and ultimate effects of policy."

"Access mapping through commodity chain analysis is an effective approach to tracing out the social and political-

economic hierarchies and networks in which extraction, production and exchange are embedded.”

“At the most applied level, commodity chain analysis is itself a policy tool. Because it identifies who benefits from the forests, and how, it can be used to evaluate whether new policies, such as proposed participatory forest management, can reshape distribution.”

5. Use of valuation elsewhere in Africa

This section of the report surveys selected valuation case studies from elsewhere in Africa of particular relevance to Western Africa. These include some studies which look at the value of environmental goods and services. Much of the research and indeed the expertise available in other parts of Africa could be of interest to environment decision-makers and managers in Western Africa.

- *Eastern Africa*

The opportunity costs of protected areas in Uganda

by Peter Howard, 1996

This study assesses in financial terms the opportunity cost of excluding human settlement, cultivation and pastoral activities from Uganda's National Parks, Game Reserves and Forest Reserves. The key recommendation is that:

“this analysis has important policy implications, since it highlights the potential long-term value of protected areas under alternative use, and the need to enhance their economic value in order to ameliorate inevitable future conflicts over land-use.”

Economic benefits of biodiversity exceed the costs of conservation at an African rainforest reserve

by Robin Nairoo and Wiktor Adamowicz, 2005

This paper reports on a study quantifying the costs and benefits of avian biodiversity at a rainforest reserve in Uganda. Key findings and recommendations are:

“Although conventional wisdom suggests that biodiversity conservation is often a non-competitive form of land use and,

therefore, requires subsidizing, our results suggest that the economic benefits derived from avian biodiversity could protect 80-90% of a tropical forest reserve's bird species."

"Purchasing land to reforest agricultural areas to support forest bird communities would be economically infeasible. This difficulty suggests that a "window of opportunity" for *in situ* conservation exists in the Mabira Forest area and that preserving existing forest now will be far cheaper (and probably more ecologically meaningful) than attempting to rehabilitate degraded ecosystems in the future."

Biodiversity and nature-based tourism: The potential for sustainable development in Uganda
by Robin Nairoo and Wiktor Adamowicz, 2005

This is a more detailed staff paper of a study quantifying the costs and benefits of avian biodiversity at a rainforest reserve in Uganda.

- *Southern Africa*

Economic valuation of communal rangelands in Botswana: A case study
by Jaap Arntzen, 1998

This paper undertakes a valuation exercise in an effort to address causes of under-valuation. The objective is to estimate the annual direct use value of an average hectare of communal rangeland in Botswana, based on an analysis of secondary data. The exercise incorporates the three major direct uses, both marketed and non-marketed, of rangelands - livestock, wildlife and gathering. It makes a number of policy recommendations as well as recommendations for future research.

Introducing lion into Pilanesberg: An economic assessment
by Deborah Vorhies and Frank Vorhies, 1993

This study focuses on the economic impacts of introducing lion. It quantifies the expected benefits and the expected costs from their introduction. The key results and recommendations were:

"Bop Parks stands to lose roughly R1 million per year in 1993 rands from the introduction of lion. The region including Bop Parks, on the other hand, stands to gain roughly R26 million per

year. Thus the introduction of lion into Pilanesberg makes good economic sense.

“There is however an income distribution problem. Under current arrangements, the lion's share of the profits will go to Sun Bop while Bop Parks must cover all the costs. We suggest that some form of joint venture relationship be set up including at least Bop Parks, Sun Bop and Stocks Leisure to finance and manage the lion introduction programme. This joint venture relationship should ensure that all parties share in a mutually acceptable manner the costs and revenues associated with the introduction of lion.”

Private supply of protected land in Southern Africa: A review of markets, approaches, barriers and issues
by Wolf Krug, 2001

A first attempt to assess the role of the private sector in supplying protected land or ‘land under wildlife’ in southern Africa. The key results and recommendations of this most informative study are as follows:

“Although only limited information exists on private conservation initiatives, it is possible to conclude that the private sector plays an indispensable role in the provision of biodiversity in the region. A minimum of 14 million hectares of private land is under some form of wildlife protection or sustainable wildlife management. This equals almost half the size of the United Kingdom, or half the size of all state protected areas in the region. Private reserves, conservancies and game ranches protect critical habitat in various regions and play an important role in the protection of highly endangered species including black and white rhino. Consumptive and non-consumptive wildlife utilisation have proved to be economically competitive and environmentally sound forms of land use and have displaced livestock farming on a large scale. In addition, wildlife utilisation as a complementary land use alongside livestock is proving a sound differentiation from pure livestock ranching. Beside the economic benefits accruing to landowners, private reserves and game ranches provide the public good ‘biodiversity’ at zero cost to the tax-payer. The experience from southern Africa further supports the economic theory that secure property rights to land and wildlife are an essential ingredient

in any strategy to conserve and encourage long-term investment in wildlife habitat. It is important to recognise that markets for biological resources are responsible for the private supply of wildlife habitat, and that any policy impairing the relative competitiveness of wildlife as a land use will have a direct impact on the private supply of biodiversity."

- *Out of Africa*

There are, of course, many hundreds of valuation studies from other parts of the world, including other parts of the developing world. Three examples from developing countries are listed on the website associated with this report. These are:

Economic valuation of biodiversity in Oman

by Rasool Al-Jabiri, 2001

This study highlights the economics value of biodiversity in Oman through a simple quantitative model.

Economic valuation of forests in Himachal Pradesh

by Madhu Verma, 2000

This study generates economic values for various goods and services provided by the forests.

Economic valuation of Bhoj wetland for sustainable use

by Madhu Verma, 2001

This study captures the values of the wetlands in the perspectives of the various stakeholders.

Under the Literature section of the associated website there are also links to key websites and papers on economic valuation from around the world. Of particular interest, is a website managed by the Government of Canada which provides case studies which could be used to estimate the benefits of environment goods and services in other parts of the world. This so-called "benefits transfer" site can be found at: <http://www.evri.ec.gc.ca/>.

The following section further discusses opportunities for collaboration between Western Africa and other parts of the world.

6. Building capacities for valuation in Western Africa

The topic of capacity building for valuation was on the agenda of the 11th SBSTTA meeting of the Convention on Biological Diversity. This section builds on the official background documents for this meeting and the recommendations coming out of the meeting.

According to the Earth Negotiations Bulletin (<http://www.iisd.ca/biodiv/sbstta11/>):

“SBSTTA recommends that COP-8: consider the establishment of a process of systematic analysis and information exchange among CBD parties; encourage organizations and initiatives to extend capacity building and training on biodiversity valuation; invite institutions that support web-based information systems and databases on valuation to fully include cases on biodiversity valuation; and invite funding institutions to identify gaps and needs to support building or enhancing national capacity. COP-8 is recommended to request the Executive Secretary to: continue the compilation of information on methods for biodiversity valuation; and explore with relevant organizations options for cooperative activities, as well as options for innovative tools for biodiversity assessment and valuation.”

6.1. Institution building

With respect to institution building, document UNEP/CBD/SBSTTA/11/9 stated:

“Adequate institutional arrangements can generally be identified as an important precondition to the further promotion of valuation as a tool in biodiversity management and the generation of reliable valuation studies. These arrangements should inter alia provide a clear assignment of responsibilities for conducting appraisal processes and auditing for quality control.”

The document then highlights some key areas for institutional development including:

- biodiversity values and national income accounts,
- development of national guidelines,
- involvement of stakeholders as well as indigenous and local communities,

- awareness raising, and
- pilot projects.

All of these are of critical importance to developing institutions for environmental valuation in Western Africa. Given the limited number of studies, pilot projects may be most useful at this stage. As the document explains:

“Undertaking valuation studies as pilot projects on key domestic ecosystems can be another effective means to raise awareness of the value of biodiversity resources and functions and associated ecosystem services, and to advance the application of biodiversity valuation in domestic decision-making procedures.”

6.2. Training

Training is a particularly urgent need in Western Africa. The background document for SBSTTA 11 referred to above states:

“The effective application of tools for the valuation of biodiversity resources and functions and associated ecosystem services requires considerable capacity and technical expertise. In many countries, capacity needs to be enhanced for putting adequate institutions in place, for conducting effective appraisal processes including the valuation of biodiversity and associated ecosystem services, for improved oversight and auditing for quality control, as well as for putting valuation results to good use in governmental decision-making by an effective and credible follow-up.”

The document also highlights some key areas for capacity building including:

- regional workshops,
- regional and international cooperation and training, and
- international databases for benefits transfer.

With respect to cooperation and training, the Western Africa region could benefit specifically from recommendations for the following:

- regional training centres,
- academic exchange programmes,

- short-term courses offered by international organisations,
- arrangements between agencies for temporary secondment, and
- CD-Rom based resources and training manuals.

6.3. Research

Finally, with regard to research, the above-mentioned background document notes that:

“important opportunities for further research and development remain. Research initiatives that address these opportunities and seek to establish regional or international cooperation and exchange should be supported.”

For a region such as Western Africa, it is particularly important that the development, conservation and development areas ensure that it is a full participant in new research initiatives in priority areas such as:

- biodiversity valuation and national accounting,
- valuation tools,
- benefits transfer, and
- linkages between biodiversity, biodiversity functions, and associated ecosystem services.

Furthermore, as work on research and pilot projects for environmental goods and services develop, Western Africa would benefit from inclusion in these efforts.

7. Linkages to the GEO-4 report

This section highlights relevant linkages to the UNEP's upcoming GEO-4 report including issues selected by policymakers for inclusion in the report.

- **Linkages to the comprehensive annotated chapter outline**

Page 2 ... Key chapters for the topic of economic valuation are Chapter 5 on Biodiversity, Chapter 6 on Regional Perspectives (particularly the section on Africa), and Chapter 7 on Interlinkages. Also of importance are Chapter 2 on Atmosphere, Chapter 3 on Land, and Chapter 4 on Water. Valuation studies may be relevant to the various topics covered in these chapters.

Page 5 ... Regarding Chapter 2 on Atmosphere, the main topics are: air pollution, climate change, and ozone depletion.

Page 9 ... Regarding Chapter 3 on Land, the main topics are: rapid land use change, forests and woodlands, desertification, erosion, nutrient depletion, water scarcity and water quality, salinity, contamination/pollution, and perturbations of biologically mediated cycles.

Page 12 ... Regarding Chapter 4 on Water, the main topics are inland waters, coastal areas, and marine areas. These are also to be reported on in the context of human-wellbeing and development factors: human health, water availability, food security, human safety and security, and socioeconomic development and livelihoods.

Regarding these factors, the outline emphasises:

“Resource economics - pricing of ecosystem services; valuation methodologies (monetary and non-monetary).”

Regarding responses and interventions, the outline emphasises:

“Financing mechanisms and incentives
Incentives, deterrents, pricing and markets, Corruption, Private sector, Certification”

Page 17 ... Chapter 5 on Biodiversity is the most relevant chapter for environmental valuation in Western Africa. It contains a key quote from the outline:

“Our challenge is getting the values right—cultural, economic, and social—so that the biodiversity of today is available for the generations of the future. ... The issues of providing greater value are not simple and will take research, imagination, and good will to sort through.”

Also, the global overview section of the chapter will:

“Introduce the links between biodiversity and the provision of ecosystem services. Highlight a number of ecosystem services that play a role in sustainable development (e.g. medicinal species, fisheries, forest products, bushmeat) and present trends in these services. Key issues—loss of biodiversity, current use of biodiversity

(agriculture, health, water purification, cultural...), potential uses of biodiversity (bioprospecting in marine and terrestrial areas)."

Valuation plays a key role as well in the section on the drivers of change in biodiversity:

"Overview of indirect drivers (focus on population, consumption, Can we add undervaluation?"

"Using the example of economic growth as an indirect driver, this chain will be explored to show both negative and positive effects on biodiversity. Value of biodiversity (internalisation of, natural capital). Patterns of growth and consumption. Examples will be given such as a case study of deforestation in Cameroon: economic growth in industrial countries leading to depletion of local forest and fisheries reserves, elevated price of hardwood, and finally demand for hardwoods in Cameroon. Also success stories - economic growth leading to investment in protected area systems and substitutes for biological products which has led to reduced exploitation."

Regarding Chapter 5 on Biodiversity, the main topics/themes are biodiversity and: health, agriculture, materials and energy, security, and cultural values.

Regarding health, one of the responses in the outline is to:

"Examine undervaluation of current and potential uses of biodiversity for human and environmental health."

Regarding agriculture, responses in the outline include:

"Opportunities for sales and entrepreneurship using local biodiversity - pathway to prosperity."

Regarding materials and energy, the outline needs "to be elaborated."

Regarding (livelihood) security, the outline emphasises the impacts from natural disasters such as:

"Consequences for human well-being: number of casualties, economic losses, social and cultural impacts."

Regarding cultural values, the outline has a section on historical analysis of "rural people":

"Directly receiving their goods and services from the immediate environment. Cultural beliefs, values, knowledge support perception of dependence on nature for human well-being, need for caring and stewardship, non-material valuation of resources and restraint in their use. Changes due to shift toward dominant culture begin to break down transmission of traditional beliefs, values, and knowledge, leading to more material, consumptive, wasteful behaviours. Degradation of environment in turn negatively affects their well-being."

This section also looks at "poverty as a driver":

"Rural using biodiversity beyond carrying capacity, and needs to feed urban poor leading to keeping prices low."

Under Part III of this chapter on Synthesis will include "a focus on ... improving the valuation of biodiversity."

Regarding policy development and implementation, the outline emphasises:

"Valuation of goods and services and recent attempts to reduce perverse incentives (subsidies and infrastructure impacts) and create markets or payment programs to increase incentives for conservation and protection of biodiversity and ecosystems."

And it also highlights next steps:

"Evaluation of valuation programs and further development.
Green accounting (national), triple bottom line (corporate)
Research on sustainable use and compliance mechanisms."

Page 27 ... Regarding Chapter 6 on Regional Perspectives, the section on Africa focus on land degradation:

"The chapter will underscore the Land degradation issue, and the initiatives in combating it."

The outline further states:

"The following will particularly be illustrated:

- adding value to the land resource that is not degraded;
- using land resources efficiently (and sustainably) to derive maximum benefit;
- making a case for safeguarding and improving the undegraded land asset”

Page 54 ... Regarding Chapter 7 on Interlinkages, insights from this report on environmental valuation should be able to provide input:

“This Chapter will address the question of whether policy coherence based on the analysis of interlinkages can provide multiple benefits to society and environment with minimum additional cost and deal with reality on the ground.

Benefits to environment and for development can be realised by adopting an appropriate mix of policy responses and practices (technology, societal and behavioural, economic...) that explicitly recognize the linkages that exist within and amongst environmental change.

What are the most efficient responses? Legal mechanisms (issue of enforcement/compliance)? Change in values and mindset (challenge to get people to think differently and in an integrated way)? Market-lead responses? Education (no one-fits-all solution - need for education at all levels - community, policy-makers)? Institutional integration?”

Valuation may be particularly important for identifying “benefits of considering interlinkages” including:

“Cost-effective to deal with multidimensional impacts

“Marginal cost of adopting an interlinkages approach is minimal when compared to the opportunity cost and benefits, especially at the national level ...

“Potential for enhanced cooperation and collaboration for projects, investment and financing, as well as enhanced international environmental governance (ex: coherence between policies and activities of UN agencies - coordination between scientific and technical activities, harmonization of national reporting, joint capacity building activities...)”

Of relevance to the Western Africa context, the chapter highlights linkages among: "Climate change-Land Degradation-Biodiversity".

Page 62 ... Regarding Chapter 8 on Challenges and Opportunities, environmental valuation may be able to provide insights for the vulnerability framework used to address opportunities:

"In the overall context of GEO-4, this chapter seeks to find opportunities for improving human well-being by mainstreaming the environment into six important policy domains (cross-cutting issues): poverty; human health; institutions and governance; trade; science and technology, and conflict and cooperation.

"A vulnerability framework is used to look at the relevance of these six cross-cutting issues to human well-being. Vulnerability is very context and place specific. Therefore we include place-based integrated assessments of the interactions between environmental change, the impact of the changes on human well-being and the loss of ecosystem services."

The chapter also highlights key "domains for policy-making" which are similar but not entirely the same as the themes in the biodiversity chapter: poverty, human health, science and technology, trade, conflict and cooperation, and institutions and governance.

Page 66 ... Regarding Chapter 9 on The Future Today, valuation studies might provide inputs into the scenarios which will be presented.

Page 68 ... Regarding Chapter 10 on Policy Options, the list of "emerging policy options" have direct relevance to valuation:

- "Informational regulation (e.g. PROPER system in Indonesia)
- Economic instruments (e.g. Carbon taxes)
- Voluntary agreements (e.g. Netherlands Environmental Policy, clean production mechanism)
- Civil society initiatives
- Eco-labelling (e.g. Blue Angel, certification schemes for forests, fisheries etc.)
- Private-public partnerships (e.g. Equator principles)
- Local Agenda 21

- Corporate environmental and social responsibility (e.g. Global Reporting Initiative)
- Eco-currencies (e.g. Japan)
- Carbon trading (e.g. WB carbon prototype fund, CDCF)
- Developing markets for environmental services and goods (e.g. California wetland swaps, Panama national protected areas system)
- Debt for nature swaps
- Transboundary parks and protected areas (e.g. MesoAmerican Biological Corridor)
- Joint implementation and cleaner development mechanism
- Circular economy (e.g. 3Rs in Japan, and circular economy in PRC)
- Integrated decision making mechanisms (e.g. sector-wide approaches)”

In short, environmental valuation is relevant to much of the GEO-4 and examples from Western Africa will highlight its relevance in some of the most fragile and threatened ecosystems and communities.

- **Linkages to issues selected by policymakers for inclusion in the GEO-4 report**

Page 2 ... Section B on the objective, scope and overall outline of the fourth Global Environment Outlook Report, notes matters of relevance to environmental valuation including:

“Assessing interlinkages between major environmental challenges and their consequences for policy and technology response options and trade-offs, identifying success stories and lessons learned, and assessing opportunities for technology and policy interventions for both mitigating and adapting to environmental change;

“Assessing challenges and opportunities by focusing on certain key cross-cutting issues inter alia as they relate to those included in the **Bali Strategic Plan for Technology Support and Capacity-building** relating to how environment can contribute to the sustainable development goals and targets and how environmental degradation can impede progress towards those targets, with a focus on vulnerable groups, species, ecosystems and locations, ...

“Assessing environment for human well being and prosperity, focusing on the state of knowledge regarding the effectiveness of various approaches to overarching environmental policies, in particular mainstreaming environmental concerns into the plans and policies of social and economic dimensions of sustainable development including major sectors and enforcement of and compliance with multilateral environmental agreements ...”

The Bali Plan includes a commitment to “promote, facilitate and finance access to and support of environmentally sound technologies and corresponding know-how.” The application of environmental valuation techniques and the application of valuation knowledge is relevant here.

Page 3 ...

Regarding section C on key questions for the fourth Global Environment Outlook report, the statement asks questions pertinent to the use of environmental valuation:

“Where do we stand in the evolution of ideas and concepts on the environmental dimensions of sustainable development?”

“How does the fourth Global Environment Outlook deal with the multidimensional, multiscalar, multidisciplinary and temporal nature of the interactions between environment and society?”

“How does the environment contribute to sustainable development, human well-being, prosperity and alleviation of poverty, and which groups and geographical areas are vulnerable to environmental change?”

In preparation of the valuation report and its inclusion into GEO4 these questions need to be kept in mind.

Regarding challenges and issues, the statement presents a long list:

- “biodiversity;
- freshwater;
- coastal and marine areas;
- forest;
- land;
- desertification;
- mountain areas,
- urban areas;

- polar areas;
- atmosphere;
- disturbed bio-geochemical cycles:
- chemicals:
- waste; and
- natural and human induced hazards and conflicts, including peace and security.”

Most of these are covered in the comprehensive outline. Further issues are highlighted in the statement in the context of the MDGs:

“How is the environment contributing to the implementation of the internationally agreed development goals, including those contained in the Millennium Declaration, in areas such as

- human health,
- food security,
- poverty alleviation,
- energy, and
- disaster-preparedness?”

The statement also addresses the important topic of interlinkages with questions relevant to valuation such as:

“What are the key interlinkages between the various forms of environmental change and human activities? ...

“How are the human drivers, activities and impacts interlinked and to what extent can they be decoupled in order to change the human-environment interaction if need be?”

Regarding environment for development, the statement asks questions to which environmental valuation can play a significant role:

“What instruments exist to mainstream environmental concerns into social and sectoral plans and policies, including contributing to sustainable-development and poverty-reduction strategies?

“How do we address the need for science, data, indicators, monitoring and assessment to measure progress towards the environment dimension of the Millennium Development Goals?”

A challenge for the GEO-4 report is to build an awareness of and indeed a demand for environmental valuation research and studies among decision-makers. To do so, valuation research and studies - particularly in Western Africa - will need to be directly linked to policies for sustainable development and poverty alleviation.