

## Economic Valuation in Western Africa

### Executive summary

#### 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 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 give 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:

<b>Table 8.1: Approaches to valuation</b> <i>Approach</i>	<i>Why do we do it?</i>	<i>How do we do it?</i>
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:

<b>Box 4. Total economic values of protected areas</b>				
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**

*[MORE FORTHCOMING ...!]*

This section of the report surveys valuation case studies from Western Africa.

- **Cameroon**

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

Prepared at the request of the ministers in charge of forests of central Africa (COMIFAC). Analyses opportunities and constraints for introducing new financial mechanisms.

(by Melissa Moye and Brigitte Carr-Dirick, 2002)

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

Describes an exercise undertaken to assess the economic effects of floodplain degradation in the Waza Logone region of Cameroon.

Presents an economic justification for government and donor investment in flood release measures to restore the hydrology and biodiversity of the floodplain.

(by Lucy Emerton, 2003)

- **Nigeria**

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

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.

(by Derek Eaton and Marie-Thérèse Sarch, 1997)

- **Senegal**

***The economic value of wild resources in Senegal***

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.

(by Cheikh Oumar Ba et al, 2003)

***Summary of the Djoudj and Diawling valuation studies***

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.

(by Oumou Koulsoum Ly et al, 2003)

***The draft report of the valuation study of Djoudj National Park***

(by Oumou Koulsoum Ly et al, 2003)

***The draft report of the valuation study of Diawling National Park***

(by Oumou Koulsoum Ly et al, 2003)

***Theorizing access: Forest profits along Senegal's charcoal commodity chain***

Examines the distribution of benefits from Senegal's charcoal trade and the multiple market mechanisms underpinning that distribution.

(by Jess Ribot, 1997)

**5. Use of valuation elsewhere in Africa**

*[MORE FORTHCOMING ...!]*

This section of the report surveys selected valuation case studies from elsewhere in Africa of particular relevance to Western Africa.

• ***Eastern Africa***

***The opportunity costs of protected areas in Uganda***

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.

(by Peter Howard, 1996)

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

Reports on a study quantifying the costs and benefits of avian biodiversity at a rainforest reserve in Uganda

(by Robin Nairoo and Wiktor Adamowicz, 2005)

**Biodiversity and nature-based tourism: The potential for sustainable development in Uganda**

More detailed staff paper of a study quantifying the costs and benefits of avian biodiversity at a rainforest reserve in Uganda (by Robin Nairoo and Wiktor Adamowicz, 2005)

- ***Southern Africa***

**Economic valuation of communal rangelands in Botswana: A case study**

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. (by Jaap Arntzen, 1998)

**Introducing lion into Pilanesberg: An economic assessment**

Focuses on the economic impacts of introducing lion. Quantifies the expected benefits and the expected costs from their introduction. (by Deborah Vorhies and Frank Vorhies, 1993)

**Private supply of protected land in Southern Africa: A review of markets, approaches, barriers and issues**

A first attempt to assess the role of the private sector in supplying protected land or 'land under wildlife' in southern Africa. (by Wolf Krug, 2001)

[CONSIDER ADDING ADDITIONAL STUDIES FROM OUTSIDE AFRICA FOR SELECTED ECOSYSTEMS.]

**6. Building capacities for valuation in Western Africa**

- 6.1. Institutions
- 6.2. Training
- 6.3. Research

**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 (eg. 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)”

*[ADD SUMMARY LINES]*

- **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?”

*[ADD SUMMARY LINES]*