

2 CONCEPTUAL FRAMEWORKS FOR CONSIDERING THE BENEFITS OF NATURE

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Key Messages

- **You can chose.** There are a number of different frameworks available to identify and assess ecosystem services and biodiversity.
- **Make the implicit explicit.** A stepwise approach allows local policy makers to explicitly include nature's benefits in decision making.
- **Context is everything.** Decision making needs the full picture. The strengths of the Millennium Ecosystem Assessment and the Total Economic Value frameworks are that they include the broad range of ecosystem values and services.
- **It's more than what's at stake. It's who's at stake.** The Sustainable Livelihoods Approach makes the effects that ecosystems have on well-being at the local and individual level visible. This approach helps address the distribution of benefits amongst stakeholders.

“Quality of life does not only measure availability of material goods, but allows human beings a life in dignity.”

Amartya Sen, Noble Prize Winner Economic Sciences in 1998

This chapter shows **how different frameworks can be used so that ecosystem services and biodiversity can be taken into account in local development**. One of the main reasons for the continued degradation of →*ecosystems* and →*biodiversity* is that the benefits of conserving them go unrecognised. Raising awareness of the benefits amongst stakeholders is important, as is incorporating local people’s needs into conservation proposals.

Each framework discussed in this chapter focuses on different aspects of values and development. **Which framework** or combination of frameworks **is most useful** will depend on various factors including:

- **The policy area** (a different approach is required for land-use planning compared with the provision of better health care from medicinal plants);

- **The local context** (whether it is an urban or rural setting, or in a developing or industrialised country);
- **Institutional and social conditions** (data availability, the degree of development of the planning process and legal system).

The key objective for each of these frameworks (the added value for local policy makers), is to make benefits visible. The chapter presents a stepwise procedure for explicitly incorporating →*ecosystem services* into local decision making (2.1) and provides a broad overview of the frameworks linking them to these steps (2.2). Each framework is considered in turn: the Millennium Ecosystem Assessment; Total Economic Value; Ecological approaches and a more developmental approach. Finally, action points are suggested (2.3).

2.1 HOW TO ASSESS NATURE’S BENEFITS: A STEPWISE APPROACH

Whilst different policy contexts imply different opportunities and priorities, there are questions common to all local planning decisions:

1. What does nature provide us at the local level?
2. How valuable is this?
3. How do we evaluate these ecosystem services or value them in monetary terms?
4. Who is affected by changes in services?
5. How might those affected by these changes alter their behaviour?

The steps set out below should be treated as complementary to other types of assessments or financial feasibility studies. Other assessments might fail to record changes in ecosystem service provisioning and undervalue the key role that biodiversity and ecosystems play in delivering them.

STEPS TO INCLUDE NATURE IN DECISION MAKING

The six steps (adapted from the World Resources Institute 2008) are explained with reference to a generic example – namely a marked deterioration in water quantity and/or quality.

STEP 1: SPECIFY AND AGREE ON THE PROBLEM

The first and most fundamental question is: Do the policy makers and affected →*stakeholders* perceive the problem in the same way?

The deterioration in the water quality and quantity could be the cumulative outcome of many factors impacting on local ecosystems.

- Do all stakeholders see it this way?
- Do stakeholders have enough basic understanding of hydrology and river basin management to understand the potential root causes of the problem? What are the pressures on the ecosystem?
- If the stakeholders lack understanding, can they be convinced that further, more focused assessment is required?

Whilst the answers to these questions may be 'no', it is important to appreciate that successfully implementing an ecosystem approach depends on cooperation and shared understanding and expectations.

Step 1 is likely to be coordinated by the decision maker but it may be driven forward by another stakeholder such as an environmental Non-Governmental Organisation (NGO).

STEP 2: IDENTIFY WHICH ECOSYSTEM SERVICES ARE RELEVANT TO THE DECISION

A starting point is provided by the Millennium Ecosystem Assessment (MA 2005). It presents a list of ecosystem services some of which may be monetized. Broadly speaking there are two ways in which services can influence policy:

- The **policy or decision might depend upon** the provision of **ecosystem services**. For instance, the development of tourism, flower farms or agribusiness might depend on water availability and quality.
- The **policy or decision might affect** the provisioning of **ecosystem services**. For instance, a switch from extensive to intensive agriculture that uses irrigation and fertilizer inputs might affect water availability and quality downstream.

An appropriate scoping exercise in terms of both time and spatial scale is needed for Step 2. Water quantity and quality may be low today because of actions taken ten years ago, whilst actions today might have an impact ten years or more into the future. The spatial scale may be large - water availability in the Serengeti in Tanzania depends in part on the extent of deforestation in the Mao forest in neighbouring Kenya.

Step 2 is likely to be carried out by internal technical staff or external consultants.

STEP 3: DEFINE THE INFORMATION NEEDS AND SELECT APPROPRIATE METHODS

The type of decision to be made determines the kind of information needed. Assessments of ecosystem services can differ in various ways: services to be considered, depth of detail, time horizon, spatial scope, monetization of the results, or the format of the information. The better such aspects can be defined beforehand, the easier it will be to select the method for analysis and interpret the findings. Methodologies that place a monetary value on ecosystem services are set out in Chapter 3. The question of whether or not to apply a monetary measure-of-account should not obscure the fact that a system needs to be applied to determine **how important one ecosystem service is relative to others**. Using 'money' is one way, but not the only way. An alternative approach (multi-criteria analysis) is also discussed in Chapter 3.

Determining information needs is likely to be led by the decision maker; if valuation is to be implemented, this is likely to be the domain of a technical expert.

STEP 4: ASSESS THE EXPECTED CHANGES IN THE FLOW OF ECOSYSTEM SERVICES

The key questions relating to this step are:

- To what extent is the policy or decision viable without the availability of ecosystem services? Is there a substitute and is the supply of this substitute dependable? If the water supply is required for a hydro-electric power plant, is there an alternative oil-fired generator available in the event of water shortage?
- To what extent will the policy or decision impact upon ecosystem services? What will be the expected change in ecosystem service availability? To what extent will this affect local livelihoods? If water is diverted for irrigation, what will be the effect on users downstream and how will their productivity be affected?

Ecosystems respond to changes in a non-linear way: if implementing a policy or decision, consider whether it will result in any critical 'tipping point' being passed. A relatively small increase in fertilizer may lead to a massive change in water quality if an 'algal bloom' is triggered. The biological frameworks described below can help to identify tipping points.

Box 2.1 Using a 'report card' system

WRI (2008) outline a 'report card' system which is useful for step 4. This technique involves identifying:

- The affected ecosystem services (list them);
- How much the local area depends on the provision of each service;
- Recent trends in the provisioning of each service (are they stable, decreasing, or increasing?);
- The strength of the impact of drivers (how significant have the recent cumulative impacts been? high, medium or low).

For our water example, the 'report card' responses might be:

- Regulation of water flows/waste treatment;
- High (demand from agri-business)/high (water treatment facilities incapable of dealing with increased sedimentation or pollution);
- Decreasing (water availability)/increasing (pollution)
- High (land-use change: deforestation)/high (agricultural intensification).

Even if tipping points are not reached, the supply of the ecosystem service relative to demand needs consideration, including cumulative impacts. Using 10% of available water supply for irrigation in water-rich Scotland is likely to have a lower impact than the same percentage being extracted in water-poor Cyprus.

Step 4 is likely to be carried out by analysts, consulting with stakeholders, including the decision-maker, but it could also be carried out by an NGO or local policy staff.

STEP 5: IDENTIFY AND ASSESS POLICY OPTIONS

Step 5 is the key evaluation procedure of the policy option(s). A similar report card system might be applied as in Step 4, but simply evaluating high, medium, or low may be insufficient unless the decision is relatively clear-cut. If monetization was decided upon in Step 3, this would be applied in the assessment of available options. If not, the alternative measure would be employed.

A risk assessment, as part of this step, will reflect the risks inherent in implementing different option strategies. 'Sensitivity analysis' is discussed further in the context of cost-benefit analysis in Chapter 3. A conventional SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) can also be carried out for each option.

Step 5 is likely to be carried out by either an experienced member of the local policy team or an external technical expert in collaboration with the decision maker.

STEP 6: ASSESS DISTRIBUTIONAL IMPACTS OF POLICY OPTIONS

The final step assesses **which stakeholders are likely winners or losers from a policy proposal**. It is important for determining whether the livelihoods of vulnerable individuals or communities are being negatively impacted. Again, a score card system might be used, to establish how much each stakeholder is affected and to identify their vulnerability to this change. Do alternatives exist?

Distributional aspects relate to poverty and the impacts on the less well-off in society. This analysis should be carried out for ethical reasons irrespective of whether the poor can influence implementation.

Step 6 is likely to be carried out by an analyst with input from the decision-maker.

A SUMMARY OF THE STEPS

These **six steps** are presented with the core TEEB vision in mind: to provide an improved basis for local decision makers when considering projects and policies that impact upon natural ecosystems. According to the specific situation, some steps are more important than others. The following frameworks can provide inputs and help adapt the steps to specific needs. Taken together, adapted to local needs, and incorporated into the decision making procedures in place, **these steps are a systematic way to include ecosystem services, and thereby natural capital, in local policy.**

2.2 AN OVERVIEW OF THE FRAMEWORKS

These frameworks have been developed to better understand how →*human well-being* depends on nature and/or what is required to maintain well-functioning ecosystems.

Each of the following five frameworks has a different focus according to whether they are based on an economic, ecological or developmental approach (Table 2.1). Which framework is most relevant will depend on specific policy contexts and user requirements.

A broad distinction exists between these different frameworks based on whether they include:

1. Purely monetary values: Total Economic Value.
2. Non-monetary values: Key Biodiversity Areas; Critical Natural Capital.
3. Combination of monetary and non-monetary values: Millennium Ecosystem Assessment; Sustainable Livelihoods Approach.

It has been argued that using →*monetary valuation* of ecosystems and biodiversity buys into the very

Table 2.1 Summary of frameworks for valuing and evaluating ecosystems and biodiversity

Focus	Framework	Purpose and objectives
Socio-ecological	Millennium Ecosystem Assessment (MA)	Classifies ecosystem benefits into categories (e.g. supporting and regulating services) which can in some cases be monetized. Explicit accounting for systemic effects such as resilience.
Economic	Total Economic Value (TEV)	Conventional economic approach to valuing ecosystems in monetary terms. Considers intrinsic values, i.e. conservation for its own sake, irrespective of benefits to people. Scale of analysis is generally at the individual project-level. Does not integrate systemic issues.
Ecological	Key Biodiversity Areas (KBA)	Designates priorities for conservation, but based purely on ecological criteria. Can be used in conjunction with economic analyses but is 'stand-alone'. Links to the MA – focuses on biophysical processes.
	Critical Natural Capital (CNC)	System of prioritizing conservation and environmental protection. Based on assessment of ecological values and human pressures that affect their provision.
Developmental	Sustainable Livelihoods Approach (SLA)	A socio-cultural approach that considers capacity-building and exposure to risks. Relates to benefits and economic values but in a different way than TEV.

Box 2.2 Distributional issues: winners and losers from a conservation policy?

There are both ethical reasons and pragmatic reasons for taking distributional issues into account. For instance, is it fair to force a landowner to stop using their land so as to protect a threatened species? Such a policy may be in society's interests, but the regulatory cost burden falls solely on the landowner, whereas the environmental and social benefits are shared by all of society. If the livelihood of the landowner is affected, there is an ethical case for compensation. There is also a pragmatic case, as the landowner is likely to oppose and resist such a change if their livelihood will be negatively affected.

free-market system that is the root cause of biodiversity loss in the first place, or that sustainable management of biodiversity may well be possible without monetary valuation (see eg O'Neill 1997). A pragmatic response to this challenge is that policy makers usually have a strong preference for assessments that are expressed in monetary terms.

Another distinction between the frameworks is whether or not distributional issues are considered. A local decision maker is likely to want to know not just the overall picture, for example, the pros and cons of a particular conservation option, but also what the

option means for specific stakeholders. How policy options impact on the poorer members of society is addressed in the section on 'Frameworks addressing impacts on livelihoods' below.

The Convention on Biological Diversity (CBD) has formulated a set of guiding principles called the Ecosystem Approach (Box 2.3). The principles are formulated in an abstract manner, and provide guidance on how decisions concerning ecosystems and biodiversity should be made in society. Increasingly the approach is being put into practice in different countries and this experience is available on the web.

Box 2.3 The Ecosystem Approach

The Ecosystem Approach was adopted by the fifth Conference of the Parties of the CBD in 2000 as the main framework for action to achieve its three objectives: conservation, sustainable use and fair distribution of nature's benefits.

Many governments have adopted a framework which brings together concerns for the use and for the protection of nature's goods: the Ecosystem Approach is a set of 12 principles and five operational guidelines which integrate the objectives and activities in the wider landscape, so that they are mutually supportive. Instead of focussing on single goods (eg fish) and relying on one type knowledge only (eg fish stock assessments), the Ecosystem Approach examines the functioning of the entire system (eg coastal ecosystem), and to consider human beings and their knowledge as part of that system (eg fishing communities - their needs, rules and practices). This approach emphasizes adaptive management to overcome fixed sector perspectives as well as participatory decision making rather than a top-down model.

Local authorities can benefit from the ecosystem approach. It goes further than just analysing service flows. A focus on ecosystem services orients attention to the connections between the natural assets and the social system and can thus help to make best use of ecosystems in local development.

For guidance on how to apply or implement the Ecosystem Approach consult

- the IUCN manual for implementation: The Ecosystem Approach, Five steps to implementation (data.iucn.org/dbtw-wpd/edocs/CEM-003.pdf),
- the CBD Beginners Guide (www.cbd.int/ecosystem/sourcebook/beginner-guide)
- and the CBD collection of case studies where the Ecosystem Approach was applied (www.cbd.int/ecosystem/cs.shtml)

Figure 2.1 Linkages between ecosystem services and human well-being



Source: MA 2005, page VI

THE MILLENNIUM ECOSYSTEM ASSESSMENT

The Millennium Ecosystem Assessment (MA) framework was launched by UNEP in 2003. The MA describes the linkages between ecosystem services and how these impact on \rightarrow human well-being and \rightarrow poverty (MA 2005). The linkages are illustrated in Figure 2.1, which shows that ecosystem services directly affect human livelihoods and that we affect the amount of ecosystem services available by our socio-economic choices.

The way in which ecosystem services provide 'useful things' is illustrated in Figure 2.2. Local decision makers act under resource constraints and conservation policy options often need to be justified on the basis of 'usefulness'. Many people benefit from the 'useful things' that ecosystem services provide without realising it. They may be willing-to-pay (WTP) for some services or may already implicitly be doing so, for example, government-funded projects that are paid for through taxation. If an assessment framework can be used to make people aware of these benefits, then it is more likely that they will be taken into account in decision making.

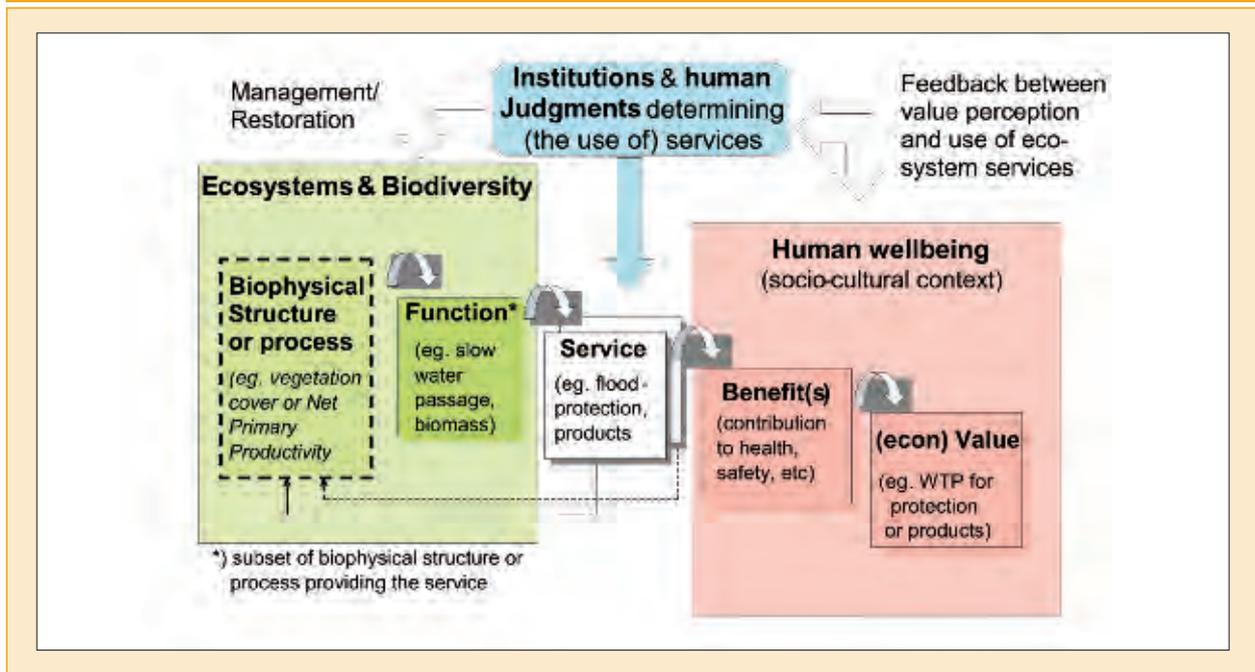
What we focus on in this report is the **level of ecosystem service** in Figure 2.2, which provides the benefit to human well-being that has a value which may or may not be recognised and expressed. We should also be aware that the service of say 'cereal provisioning' which is then consumed by humans depends upon the function of 'biomass production' which in turn depends upon the underlying biophysical structure of 'primary productivity' depending on fertile soil, water, and plants.

A detailed case study application using the ecosystem service approach proposed by the MA to assess marine ecosystems in the UK is outlined in Chapter 3; an economic analysis was conducted and the high values identified resulted in the designation of marine protected areas.

TOTAL ECONOMIC VALUE

Both the MA framework and the Total Economic Value (TEV) framework are similar in that they are both concerned with 'human endpoints', in other words what affect nature has on our well-being. The difference is nuanced: TEV focuses almost exclusively on economic

Figure 2.2 The TEEB pathway from ecosystems and biodiversity to human well-being



Source: TEEB Foundations 2010, Chapter 1

endpoints that can be measured in monetary terms (the 'human well-being' box in Figure 2.2).

The TEV framework presents **categories of ecosystem benefits** which fit into a standard economic frame of reference. It is the dominant framework for analysis of monetized benefits from ecosystems. Its strength is that all benefits that humans obtain from nature and even the value of nature in its own right (the intrinsic value) can be captured by one of the subcategories used in this approach. All inputs to the framework are required to be in quantitative monetized terms and are therefore directly comparable. A weakness is that any benefits from conservation that cannot, or should not, be monetized are easily sidelined and forgotten. TEV contains different categories of benefits or values which are outlined below:

- **Direct use value:** The value derived from the direct extraction of →resources from the ecosystem (fuelwood), or the direct interaction with the ecosystem (recreational use).
- **Indirect use values:** Those values that support economic activity. For instance, the watershed protection function of a forest leads to improved water quality which might in turn affect a flower grower downstream. There is a clear link here with the potential for Payments for Ecosystem Services

discussed in Chapter 8 (see also TEEBcase Water fund for catchment management, Ecuador).

- **Option use values:** Preserving an ecosystem or biodiversity so that its direct and indirect use values can be potentially 'consumed' in the future. Such a value may be placed on avoiding species extinction in wild variants of commercially-grown crops as this genetic diversity may be valuable in the future.
- **Non-use values:** These values differ fundamentally from the other value-types as they are not linked to economic activity, either directly or indirectly. Non-use values are also termed 'existence values' and refer to conservation for its own sake. For instance, we may value polar bears just because they are living creatures that we share the earth with and feel that we have a moral duty to preserve the habitats that support them.

The total economic value of an environmental asset is the sum of the different value categories.

TEV is a useful approach even if we cannot determine monetary values for all the categories of benefit. Having a monetary value for only some of the benefit categories may be enough justification for choosing a conservation option over a more resource-exploitative alternative. In most cases, a partial monetization is

more likely, more feasible and quite possibly less risky. By less risky we mean that any analysis must be credible if stakeholders are to accept its findings. For a more detailed discussion of TEV and how to best apply it to biodiversity and ecosystem services see TEEB Foundations (2010, Chapter 5); on valuation methods see Chapter 3, this volume.

ECOLOGICAL APPROACHES

The term ‘ecological approaches’ may be misleading as it implies that other approaches do not have a clear ecological dimension. We use this term because the following approaches clearly prioritize ecological values, and are not designed in a way that economic values can easily be assessed. Rather the focus is on identifying areas that are valuable from an ecological point of view. The two approaches discussed below can be thought of as ‘ecological stock-taking’ and can support step 4 above: assessing the expected changes in the flow of ecosystem services.

KEY BIODIVERSITY AREAS

The Key Biodiversity Areas Approach (KBA) is a rapid assessment methodology that identifies local areas which are globally important for species conservation. Areas are classified using simple and standardized criteria including references to a species' status and distribution. These criteria address the strategically important issues of →*vulnerability* and irreplaceability (Langhammer et al. 2007).



Some existing initiatives include Birdlife International's Important Bird Areas program and Important Plant Areas run by Plantlife International in collaboration with IUCN.

CRITICAL NATURAL CAPITAL APPROACH

Natural capital is a general term for the stock of natural resources; hectares of forest or litres of freshwater, for example. As we produce and consume products of natural capital, it is an input to the production process. In some cases we may think we can find substitutes for natural capital, using plastic instead of wood to make a chair, for example, but plastic itself is a product of natural capital – petrochemicals.

Critical Natural Capital (CNC) differs from other types of natural capital in that it performs important and irreplaceable ecosystem services that cannot be substituted (Chiesura and de Groot 2003). An example of CNC is the ozone layer. Were we to lose or severely deplete the ozone layer, as might have happened but for the 1989 Montreal Protocol, it is difficult to conceive of a viable technological-fix that might perform its functions. Whether we categorize a type of natural capital as critical depends on its importance and the degree of threat. There are at least six domains under which natural capital is evaluated as critically important: 1) socio-cultural, 2) ecological, 3) sustainability, 4) ethical, 5) economic and 6) human-survival.

An important issue to consider here is →*resilience*, as CNC does not only refer to global issues like ozone protection. Diverting a river in order to build a dam and allow irrigation might mean that an ecosystem downstream cannot be preserved in its current form – it is not resilient to the change and there would be irreversible damage. Depending on the context, the river might be considered to be a form of CNC (Brand 2009). There may also be critical areas for species survival or the functioning of a particular ecosystem so that it can continue to provide its services (Box 2.4).

Box 2.4 Critical value – restoration of salmon habitats, USA

Investment in restoration of two acres of salmon habitat in North Wind Weirs proved critical. The decision makers' options were either to convert the prime location to industrial use, or to conserve and restore critical salmon habitat.

A simple analysis of the direct costs and benefits on-site showed that the option of restoring habitat did not break even. However, the off-site impacts, in particular the critical nature of this area for salmon restoration throughout the entire catchment, make this option a ‘bargain’. Treating these two acres as the constraining factor in restoration efforts, it would be worth paying up to US\$ 47 million per hectare to secure the restoration. Although the opportunity cost of the land is potentially high, the area is argued to be critical natural capital. Industry could be located elsewhere, whereas salmon habitat must be situated where freshwater meets tidal salt water.

Source: Batker et al. 2005

FRAMEWORKS ADDRESSING IMPACTS ON LIVELIHOODS

Both the MA and TEV frameworks assess policy impacts at a societal level, and operate on the premise that policies aim to maximize social well-being. However the impact of an ecosystem change can have a very different impact on an individual or on different groups within society.

Any policy change, even one that is ‘clearly’ good for society, is likely to leave some people worse off. Securing land tenure for farmers, for example, may lead to a more →*equitable* society; improve the health of the ecosystem as the farmers now have a stronger incentive to take care of the land and increase income levels. However, the former landowner is unlikely to be as well off as before the change. There is therefore a ‘loser’. Virtually all policy options will have both winners and losers.

Changes in the environment may involve **tradeoffs between individual versus community strategies**. It may well be sensible for community to adopt a policy which leads to a few years of poor harvest, if it is compensated by years of plenty. If reserves can be stockpiled, or the poor harvest dealt with in some other way, this may be a good strategy. An individual may, however, be risk-averse and rationally prefer a lower average harvest yield with fewer annual fluctuations.

The frameworks discussed in this section provide a better understanding of the impact of policies on local livelihoods. They focus on how a policy proposal might impact different →*stakeholders* and how they might respond. The frameworks are particularly useful for assessing distributional impacts of different policy options (step 6 above).

SUSTAINABLE LIVELIHOODS APPROACH

The Sustainable Livelihoods Approach (SLA) is a way of looking at how an individual, a household or a community secures its well-being over time (Serrat 2008; Carney 2002). ‘Livelihood’ in the context of the SLA is made up of the capabilities, the assets (stores, resources, claims and access) and activities required for day-to-day living. It not only takes account of

monetary income but also the other forms of capital that people have access to, including:

- **Natural capital** (environmental resources such as rights to access a freshwater stream);
- **Economic capital** (cash and economic assets, such as privately-owned pastureland);
- **Human capital** (animal husbandry skills, knowledge of local market conditions, physical ability, traditional knowledge);
- **Social capital** (family, neighborhood or other social networks and associations such as a local micro-finance project).

What makes livelihoods sustainable or not, depends on their vulnerability, i.e. the degree to which an individual or population is affected by a shock or the seasons. The level of resilience is their ability to cope and withstand the shock.

Box 2.5 Shocks versus seasonal trends

Seasonal shifts can mark changes in economic activity, human and livestock health, price of goods, migration patterns and social activities. Shocks can be natural disasters such as tsunamis or locusts, but can also include economic shocks, conflict and other factors. Shocks differ from seasonal trends. Seasonal trends are more predictable and not one-off events. There are year-to-year variations in terms of seasonal trends such as if and when the monsoon rains come to the Indian sub-continent. Shocks are in some senses ‘predictable’ in that we might have some idea of their frequency, if not exactly when they will occur. For instance, climate change science tells us that there are likely to be more devastating storms in the future but science cannot predict exactly when these events will occur.

Source: Krantz 2001

The key questions are: How probable are shock and seasonality effects? Can they be dealt with? **Do policies have impacts on livelihoods by providing additional income, or by decreasing the influence of seasonality, or by increasing social capital?**

- Instruments to achieve this include Payments for Ecosystem Services (PES).

Table 2.2 Links between Ecosystem Services and the Sustainable Livelihood Approach outcomes

Description	Ecosystem Service	Outcome in terms of livelihood
 Food supply: Ecosystems can provide food directly eg from agricultural land, or indirectly, eg mushrooms or berries from forests or fodder for livestock.	Food	Food security
 Health: Intact ecosystems with high biodiversity can reduce the incidence of diseases.	Biological control	Well-being, resilience
 Clean drinking water: In many parts of the world rural people depend directly on freshwater lakes and indirectly on soil structure and quality which, in turn, regulates this supply of freshwater.	Freshwater	Well-being, resilience
Clean air: Some ecosystems can mitigate the effects of air pollution which can, in turn, impact on crop productivity.	Air quality regulation	Well-being, food security
 Fuelwood: Many people, especially the poor, rely on fuelwood for cooking and keeping warm.	Raw material	Well-being

The majority of the poor directly depend on natural resources and ecosystem services for their livelihoods. They do not have the ability to use technology to create these services or import them from elsewhere. The SLA framework allows local policy decision makers to define policy options in terms of how they affect local livelihoods. The evaluation of ecosystem services may initially seem somewhat detached from the framework, but in fact, it is inherently inter-linked. Some of these linkages are outlined in Table 2.2 and describe what ecosystems provide.

Identifying who depends on the provision of ecosystem services can help to prevent unintended impacts of development. **This analysis can also potentially identify** additional income streams.

ENTITLEMENT APPROACH

The entitlement approach focuses on **individuals' entitlements to goods and services** that affect their livelihoods. Entitlements are determined not only by stocks of capital, as illustrated by the SLA approach - natural, economic, human and social - but also by market conditions. → *Poverty* is determined not just by productive capacity, but also by what the outputs are worth in terms of what they can be exchanged for.

In his analysis of the Bengal famine of 1943, Amartya Sen found that the devastating effects on livelihoods were caused not by a lack of available food but by market conditions. In the Bengalese case, Sen argues that the opportunism and profiteering of speculators in the commodity markets meant that market conditions created the famine as the poor were unable to pay for food. Those who relied on earning wages to buy food on the open market found that the purchasing power of their wages was reduced catastrophically over a very short period of time (Sen 1981).

There is a clear link to the → *'provisioning'* service in the MA framework but the Entitlement Approach and its link to sustainable livelihoods goes further, although there are also critical reflections on the approach (Devereux 2001).

PROPERTY RIGHTS

A further concept useful to analyze who derives what benefits from ecosystem services and thus to analyze different policy options for local development affecting ecosystems and biodiversity are → *property rights*. It is important to distinguish that there is **a bundle of different rights** meaning that someone may have the

right to the benefit, for example be allowed to collect wild products from a forest while not having the right to manage the same forest or legally own the forest. When assessing different policy options it is therefore useful to carefully analyse who hold what rights

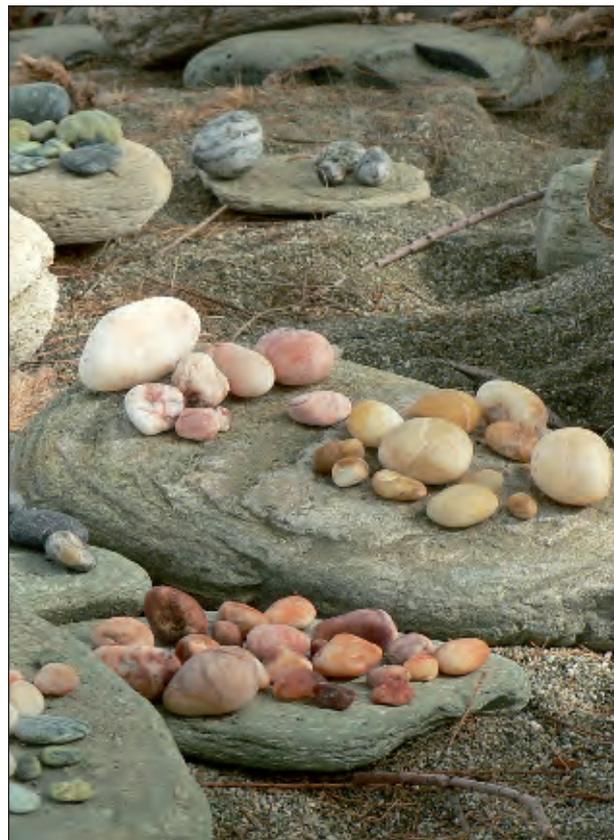
to ecosystem services and how these individuals or groups might be affected. (For more detail on property rights, see Apte 2006 or TEEB in National Policy 2011, Chapter 2).

2.3 ACTION POINTS

This chapter has focussed on the complementary frameworks that local decision makers can use to manage changes in ecosystems. Each of the frameworks applies a slightly different perspective but there is a consistent thread: ecosystems and biodiversity provide benefits to humans; many of these benefits impact at the local level; many are highly tangible even if the market fails to place a price on them. Unless we consider a systematic framework for reviewing these benefits, some categories of benefits will not be accounted for and the ‘wrong’ decisions will be made.

We suggest the following actions:

- The ecological frameworks represent the ecologist’s priorities and perspectives; TEV the economist’s; SLA the development planner’s; whilst the MA is a generalist approach. **Which one suits your decision-making scenario?**
- One course of action is to **begin by using the MA ecosystem service categories**. Then consider whether developmental, ecological and economic issues are covered adequately in your analysis and supplement the MA framework accordingly.
- All local policy decisions are carried out under some form of resource constraints. **What constraints do you face?** Can you apply the stepwise approach to the policy issue as outlined in section 2.2? Even if the analysis is less detailed than it might be under ideal non-resource-constrained conditions, is it worth carrying out some form of assessment?



The concept of Ecosystem Services helps to break down and sort the complexity of Nature in a way relevant to your policy decisions.

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FOR FURTHER INFORMATION

How to consider ecosystems in development

World Resource Institut (2008) Ecosystem Services: A guide for Decision Makers. The succinct user-friendly report uses non-technical language to describe how to integrate ecosystem services in decision making along the 'story' of a hypothetical decision in 'Rio Grande'. http://pdf.wri.org/ecosystem_services_guide_for_decisionmakers.pdf

Millennium Ecosystem Assessment (MA) (2003) Ecosystems and Human Well-being: A Framework for Assessment. Chapter 7: Analytical Approaches. This part of the MA – more academic in nature and tone – deals (very thoroughly) with frameworks for assessment. <http://www.millenniumassessment.org/documents/document.305.aspx.pdf>

Understanding what the ecosystem services are and how they fit together

Millennium Ecosystem Assessment (MA) (2003) Ecosystems and Human Well-being: A Framework for Assessment. Chapter 2. Ecosystems and Their Services. This brief introduction (22 pages) provides basic information on the ecosystem services approach. <http://www.millenniumassessment.org/documents/document.300.aspx.pdf>

Millennium Ecosystem Assessment (MA) (2010) Ecosystems and Human Well-Being: A Manual for Assessment Practitioners. This 'how to' guide assists practitioners with first experiences from the 2005 MA.

An introduction to ecosystem services, further publications and case studies are available at the Defra-funded (UK government) portal www.ecosystemservices.org.uk

Understanding the conventional economic perspective – Total Economic Value

Pearce and Moran (1994) The economic value of biodiversity. IUCN. An academic – but nonetheless accessible – book on the value of nature. <http://www.cbd.int/doc/external/iucn/iucn-biodiversity-value-1994-en.pdf>

Secretary of Conventional on Biological Diversity (2007) An exploration of tools and methodologies for valuation of biodiversity and biodiversity resources and functions Technical Series No 28. The comprehensive report on valuation methods and decision making includes 13 case studies. <http://www.cbd.int/doc/publications/cbd-ts-28.pdf>

IIED (2006) Pastoralism: drylands' invisible asset? Issue paper no. 142. This easy accessible report illustrates the development of an assessment framework and presents the Total Economic Valuation method using the example of pastoralism in Kenya. <http://www.iied.org/pubs/pdfs/12534IIED.pdf>

Understanding developmental perspectives

Information on the Sustainable Livelihoods Approach (SLA) as well as related case studies and a toolkit can be found at IFAD website www.ifad.org/sla/index.htm.

Krantz, L. (2001) The Sustainable Livelihood Approach to Poverty Reduction. Along the issue of poverty reduction the various approaches to the SLA are presented and strengths and weaknesses are pointed out. www.catie.ac.cr/CatieSE4/htm/Pagina%20web%20curso/readings/krantz.pdf