CHAPTER 5

Analysis[1]

Approaching and organizing the tasks of analysis

Sustainable development is knowledge-intensive

If strategies for sustainable development are genuinely to get to grips with priority problems and produce innovative solutions, good analysis is essential. The term 'analysis' is used in this chapter in a 'catch-all' sense to include identifying and applying relevant *existing knowledge* to the challenges of sustainable development, identifying *gaps in knowledge*, and filling them through research.

The questions and steps involved in conducting the analyses required for effective strategies for sustainable development are set out, and some of the main analytical methodologies are introduced. Analysis does not, however, take place in isolation.

Introducing the main analytical tasks in NSDS processes

Stakeholders need several types of analysis

Analysis of several types may be needed for an NSDS, including:

- *Stakeholder analysis:* Objective identification of stakeholders in the transition to sustainable development, their interests, powers and relations. This helps in constructing committees, working groups and consultation processes. As a continuous process, it should bring in those that matter but might otherwise not have come forward (page 120).
- *Sustainability analysis:* Assessing human and environmental conditions, major strengths and weaknesses, key relationships between human and ecosystem elements and between the country (or locality) and the larger system, how close the society is to sustainability, and the direction of change. This is crucial for deciding what the NSDS should address and the actions it should propose as well as for monitoring its implementation (page 132).
- *Strategy process/mechanism analysis:* Identifying and assessing the potential component systems and processes that could be used in an NSDS, by analysing their effectiveness, reliability, equitability and performance (outcomes) to date. This can apply to information, participation, investment and other component processes. It is needed to improve the quality of NSDS performance (page 161).

1 This chapter has benefited from review comments and additional material provided by Robert Prescott-Allen, Canada; Pippa Bird, USA; Jon Lindsay, FAO; and Duncan Macqueen and Joshua Bishop, IIED.

- *Scenario analysis:* Developing plausible pictures of the future, as a means to explore possible strategic options and test their robustness or sensitivity (page 171).
- *Analysis and ranking of options:* Assessing the costs, benefits and risks of optional instruments or programmes to implement the strategy, to submit to subjective decision-making – in this way avoiding biased trade-offs. Decision-making without the advantage of good analysis runs a huge risk of prejudice and misjudgement (Chapter 8).
- *Reviewing strategy achievements:* Assessing how far sustainable development outcomes have been achieved and how they can be correlated with NSDS processes. Many of these tasks are those of routine monitoring and evaluation (considered in Chapter 10).

Challenges in analysis for sustainable development strategies

EFFECTIVE STRATEGIES DEPEND ON SOUND INFORMATION

National strategies for sustainable development should be 'based on comprehensive and reliable analysis', as stated in Principle 5 of the OECD DAC Policy Guidance on strategies (OECD DAC 2001a) (see Box 3.1). Analysis should power the transformation towards sustainable development: all stakeholders need the opportunity to reflect and learn in ways which are suitable to them individually and to society as a whole – what Capacity 21 (UNDP 2000) has called the 'analysis-action-reflection' concept. 'Country-driven', participatory, integrated, continuous improvement approaches to achieving sustainable development called for by the agreements reached at the 1992 Earth Summit (NSDSs, Local Agenda 21, national forestry programmes, etc) place heavy emphases on understanding the local context, on integrating social, environmental and economic goals at local levels, on experimentation and review, and on forming local partnerships. All of this is information-intensive.

Strategies need to be based on a reliable and accurate understanding of local realities

SUSTAINABLE DEVELOPMENT IS COMPLEX AND DIFFICULT TO ANALYSE

If the challenges inherent in sustainable development are not fully explored, any strategy to promote sustainable development will remain nothing more than a bland set of exhortations, unconnected to local realities. Sustainable development requires that a large number of interacting factors be addressed and, since it also requires value judgements, there is a need to involve many groups so that multiple perspectives can be heard. These are major challenges given that multiple factors make correlations and causations difficult to prove. It may be necessary to separate out issues at field, enterprise, landscape, region, national and global levels, as different trade-offs are found at each level. Furthermore, sustainable development demands the ability to anticipate change and assess optional scenarios.

Addressing interacting factors and multiple perspectives is a challenge …

In earlier attempts at strategic approaches to sustainable development, 'analysis' often consisted merely of assessments of the status of various sustainability issues. Acknowledged 'experts' (but not always local professionals) would be enlisted to write papers assessing, for example, the status of soil erosion or pollution. Good synthesis papers have proved particularly useful if they present what is known about the strengths and weaknesses, opportunities and threats of an issue, and also set out the uncertainties and what is not known – and if they were able to kick off useful debate. But, frequently, these analyses repeated information from long ago, did not challenge assumptions and were done only in the early stages of 'preparing the strategy'.

CAPACITIES TO ANALYSE SUSTAINABLE DEVELOPMENT ARE OFTEN WEAK

This lack of experience in analysis for sustainable development is compounded by local research and analytical capacities, particularly in developing countries, often being severely constrained. Analytical mandates, frameworks and methods for analysis have tended to be narrow or focused on priorities set in the past. The lack of access to good analysis is often worst where it matters most (in poor countries and communities).

… where analytical experience and capacity is not strong

> *The experience of countries that have tried to analyse their current situations has demonstrated the grave shortage of tools available, and the serious weaknesses of Agenda 21 as a planning or predictive instrument. Ideally, it should be possible to build on the rigor of economic analysis and extend similar approaches to the inter-related domains of sustainable development. In practice, our ability to understand all the social and physical interactions involved is limited. We do not have accepted analytical techniques that bring together all of the interactions of development.*
> (UNDP 2000)

In practice, in the absence of formal analytical capacity, other democratic processes have fulfilled part of the assessment role – the 'vote' does, after all, capture public perceptions of issues. With so many sustainable development issues being of high political concern, however, the electorate deserves better information.

THERE ARE DANGERS IN RELYING ON NARROW, NON-LOCAL, OUT-OF-DATE OR UNRELIABLE INFORMATION

Reliable, up-to-date information is important

If non-local data are used, other people's myths can become the basis of change (or they merely reinforce the status quo). Out of date analysis (or, more insidiously, the recycling of unchallenged 'facts') is also clearly a poor basis for an NSDS – a problem exemplified by the case of environmental information in Southern Africa (Box 5.1). Even if analysis offers projections of current trends, this can be dangerous if scenarios are not also developed to identify possible major shifts and the consequent problems of vulnerability.

Box 5.1 Poverty of environmental information in Southern Africa

Whilst there is a wealth of documentation on the environment in the countries of Southern Africa, a major problem is that, all too often, a significant proportion of the data which they report has not been 'ground truthed' by field observations, but is based on or summarizes information from other existing sources, much of which is itself repeated from elsewhere. Furthermore, there is often uncertainty about the reliability of data in the original sources. This means that questionable information continues to be given currency without checking, and various 'environmental myths', which they are used to support, such as the extent and seriousness of land degradation in the region, are perpetuated.

In practice, for many environmental factors for which reliable data are required to assess trends meaningfully and to predict future positions, the available data are either questionable or not sufficiently available. Another example is the difficulty of making comparisons between data for rural and urban populations.

The poverty of information in Southern Africa is a serious impediment to predicting future environmental trends. However, whilst there is an undoubted problem with data availability, in some cases the problem is more one of 'invisible information' – ie information exists, but it is dispersed, inaccessible (even kept secret) or unrecognized. A key challenge in addressing many sectoral and cross-sectoral information issues is to think creatively about accessing hidden and unconventional information sources as well as making obvious existing information more useful.

Source: Dalal-Clayton (1997)

Basic principles for analysis

ENGAGE AND INFORM STAKEHOLDERS WITHIN DEMOCRATIC AND PARTICIPATORY PROCESSES

It is interesting that most of the reviews and guidance on strategic approaches have heavily stressed participation, but have barely tackled analytical methods and quality – as if the need for enhanced knowledge were over and all that is needed now is to convince people to change their behaviour and make them feel part of the process (Carew-Reid et al 1994; Dobie 2000; World Bank 2000; UNDP 2000; IMF 2001).

Democratic processes require good analysis …

Good analysis is integral to democratic processes, in which governments are trusted with developing the machinery to make complex and difficult decisions. It is also needed where there is a perceived democratic deficit, where special 'participatory mechanisms' may have been set up to help do this: for example, by development assistance agencies and multi-stakeholder initiatives (Chapter 6).

Analytical inputs are required that can be made available for decision-making through routine and acknowledged systems, that are acceptable to stakeholders, and that produce a ranking or distributional analysis, to help with questions of significance and winners and losers.

… and analytical tools themselves should enable participation

Thus, it is not a case of *either* analysis *or* participation – analytical tasks cannot be divorced from stakeholder inputs. Where groups are affected by key issues, they should be able to engage in analysis themselves. This can ensure that NSDSs are demand-driven, rather than the intellectual construct of bureaucrats and professional analysts. Thus, the analytical tools used in an NSDS should enable participation – to encourage wide ownership and to obtain information from a broad range of perspectives that might otherwise remain 'hidden'.

It is true that there is still prejudice against information generated through participatory techniques. As Dalal-Clayton et al (2000) note, findings from participatory assessments are still commonly greeted with the question 'but how do they compare with *real* data?' Participatory methods of analysis are becoming available which are more accessible to non-'expert' stakeholders and which do not require advanced skills, yet, if used well, cannot be accused of compromising the rigour and quality of findings.

USE ACCESSIBLE AND PARTICIPATORY METHODS OF ANALYSIS

Participatory analysis fosters 'learning-by-doing' …

Such action research and participatory analysis methods are becoming available. They offer the 'learning by doing' approach required for sustainable development. Certain methods help to bring multiple dimensions together. Some are more influential than others in terms of engaging decision-makers: for example interdisciplinary processes and action learning. But many are not widely known and/or require further improvement.

INCLUDE ROLES FOR INDEPENDENT, 'EXPERT' ANALYSIS

… but specialist expertise can also be needed …

While the general approach to NSDSs is a participatory one, this should not obscure the need, in many cases, for specialist expertise. This might be where:

- particular issues may be contentious (when independent commissions and/or specialized expertise may be required);
- there is a large analytical task to be undertaken (such as when it is agreed that a strategy process requires a significant baseline of information which hitherto has been absent);
- highly technical skills and equipment are required: for example scientific measurements, computer analysis of data.

… sometimes via an independent body

Where an independent institution is selected for conducting the analysis, it should show evidence of maintaining a careful balance between:

- relative independence from the policy process (in order to be able to view the big picture, critique policy and innovate without undue fear);
- active engagement with policy actors (so that analysis is, to some extent, demand-driven and gets a good hearing);
- engagement with other stakeholders (so that the institution is seen as credible and not viewed as a servant of higher powers only);
- multiple disciplines and interdisciplinary methodologies (to ensure a holistic approach).

Box 5.2 Future of the Environment Survey Office - providing analysis for The Netherlands' Environmental Policy Plan

In 1988, RIVM published a National Environment Survey – an independent scientific analysis that demonstrated the scale of The Netherlands' environmental problems and the major policy changes required to implement sustainable development. The survey was used to develop the National Environment Policy Plan (NEPP), which indicates how the government intends to deal with the problems. In 1991, RIVM published a second survey, the National Environment Outlook, examining progress with the implementation of the NEPP, the likely effect of policies, and the extent to which these policy measures would be sufficient to reach the objectives set for 2000 and 2010. It was based on the latest scientific developments and expectations about changes in society.

The NEPP is published every four years (see Boxes 4.3 and 4.5). RIVM has been requested to publish an environment survey every two years to provide an assessment and forecasting of the quality of the environment. One year after publication of the NEPP, the survey sets out the expected future quality of the environment when current policies are implemented. One year before the next NEPP, a survey of possible additional policy options is prepared. For this purpose, RIVM has set up a Future of the Environment Survey office, which coordinates the contributions from RIVM laboratories and institutes, and integrates the information and model calculations, including geographical information system (GIS) maps.

Source: RIVM (1992)

This can be a tall order, and some countries have had to support the development of such independent bodies to organize and conduct some of the larger analytical tasks. For example, the National Institute of Public Health and Environmental Protection (RIVM) conducts much of the analysis for The Netherlands Environmental Policy Plan (Box 5.2). The Sustainable Development Policy Institute in Pakistan was established to serve the NCS with policy research support, and has grown in scope and influence.

DEVELOP A CONTINUING, COORDINATED SYSTEM OF KNOWLEDGE GENERATION

Continuous and coordinated knowledge generation …

In this chapter, we propose a coherent, continuing programme of knowledge generation for sustainable development (comprising data centres, analysis and research capabilities) – and not just a one-off exercise. This should be an integral part of the NSDS process. There are several related principles here:

- Multi-stakeholder groups should design the information gathering, analysis and research process themselves, to ensure *ownership* of the strategy and its results.
- All the 'analysis' tasks laid out in this chapter are best implemented by bringing together, and supporting, *existing centres* of technical expertise, learning and research.
- Since analysis is central to strategy development, it should be *commissioned, agreed and endorsed at the highest level* (ie by key government ministries or by the strategy steering committee). This will increase the chance that analysis will be well focused and timely in relation to the strategy's evolution and timetable, and that its results will be used.
- In the same way, analysis needs *good coordination*. It is logical for the strategy secretariat or coordinating team to coordinate the analysis. However, the secretariat should not undertake all the analyses itself and, indeed, not necessarily any of it. Many players need to be involved. Through their active involvement in reflection and analysis, the strategy will help in building learning institutions.

AGREE CRITERIA FOR PRIORITIZING ANALYSIS

… keeps analysis focused on things that really matter

Without a focus on priorities, the number and type of issues addressed in the strategy process are likely to expand beyond any ability to handle them, and the process may become discredited. It is therefore important to channel attention and thought into what matters, and into what can be done with the best effect for the resources and political will currently available – and not provide a forum for unending debate.

It is important to agree criteria by which analysis – and especially expensive new research – might be prioritized. This is best assessed by reference to criteria for human and ecosystem well-being and practicality. Sustainability assessments described in "Approaches to measuring and analysing sustainability" on page 132 (eg the 'barometer of sustainability' and 'sustainable livelihoods analysis') use such criteria and will be able to reveal this.

In their absence initially, a basic checklist of criteria might be developed (Box 5.3). Among conventional techniques, such checklists are by far the most widely used and practical, and are often combined with some form of cost benefit analysis or econometric approach. This can be qualified by estimates of the chance of success, the likely rate of adoption of results and the probable time needed to complete the project (Macqueen 1999).[2] The development of strategy options and plans should also directly address these criteria, to help stakeholders to make decisions in an informed and accountable manner.

Develop a checklist of criteria for analysis …

Special interest is now placed on the approach of causal diagrams (or problem trees, see page 148) based on the capital assets in the sustainable livelihoods framework. Here, resources are allocated to research on the basis of the maximum likely impact on the five capital assets of poverty, in turn based on cause and effect linkages of poverty for specified groups of poor people. They offer an attempt to deal transparently with multiple facets of sustainable development.

ENSURE THE OBJECTIVES OF THE ANALYSIS ARE CLEAR

Analysis is least effective where it deals with 'themes' or 'subjects'. Formulating questions will provide direction to the analysis and developing solutions. For example, 'watershed degradation' is a less useful formulation than 'what incentives have encouraged watershed conservation? How can we remove perverse incentives to degrade key watersheds? And who should make the changes?' Questions should:

… and frame the analysis in terms of questions

- address a priority issue (Box 5.3);
- also address contextual issues, where possible;
- exhibit and enable the scope for policy responsiveness.

Box 5.3 Signals that an issue might be a priority for analysis and action

The issue is a priority if it:

- is an opportunity/threat to poor people's livelihoods;
- is an opportunity/threat to key economic sectors;
- is an opportunity/threat to key ecosystem assets and processes (especially where they are critical to livelihoods and sectors as above);
- is possible to act without extra finance;
- presents a major learning opportunity;
- is visible to the public;
- has an extension/ multiplier effect;
- is an international obligation;
- is timely in relation to a pending decision;
- is linked to current political concerns, other initiatives and skills.

An analysis of recent policy decisions could impute some criteria as a basis for debate and definition of a more formal set.

2 Macqueen (1999) lists the advantages and disadvantages of particular tools for prioritizing research for poverty alleviation: historical precedence; arbitrary 'armchair' subjectivity; checklists, simple or weighted; CBA, econometric analysis; and causal diagrams. Their most prominent drawback is their inability to rank interventions, which aim to tackle very different facets of poverty or sustainable development.

AGREE THE TYPES OF OUTPUT FROM THE ANALYSIS, AND WHO WILL GET THEM

Expectations about outputs should be clear

It is important that the analysis should not be a complete surprise once it has been produced, and so stakeholder expectations and political/legal procedures and implications for conducting the analysis need to be discussed and agreed beforehand. The hierarchy of possible outputs might first be discussed, to get expectations right. These may be ranked, from least to most ambitious, as: data, findings (correlating key factors), conclusions (identifying causal links), recommendations and design. For example, will the output be 'evidence', 'proposals' for a policy or initiative, or a draft policy or project design itself?

An introduction to methods available for analysis

Table 5.1 offers a very basic listing and assessment of the various analytical methods and tools that might be found useful in generating knowledge for NSDSs. Particular methods are described in more detail later in this chapter where they are recommended as especially relevant to the particular analytical task being discussed. Some of the more technical approaches (eg cost-benefit analysis, macro-economic forecasting, sector analysis and project evaluation) and detailed planning approaches (eg EIA and strategic environmental assessment) are professional fields in themselves with their own vast literature, and cannot be covered in full detail in this resource book. Table 5.2 explores some of the limitations of economic approaches compared with participatory approaches.

Technical tools have limitations

In essence, the more that the technical tools try to accommodate many dimensions and help predict outcomes, the hungrier they are for good data, and the more assumptions they tend to include. This means that they may not reflect the real world well, and may be inaccessible by non-technical stakeholders. Many analytical approaches are weak in identifying the distributional effects of different policy options – the winners and losers. This is one very good reason why analysis should be accompanied by participatory processes to consider such questions, although the impacts of policies may not always be clear even to those who are directly concerned. Note also that the division of approaches into 'expert' and 'participatory' is becoming blurred in practice.

Analysing stakeholders in sustainable development

Why stakeholder analysis is important

Involving every individual is impractical …

Stakeholders are those people, groups or institutions who have specific rights and interests in an issue or system, and related powers, knowledge and skills. With a national strategy for sustainable development, every citizen is effectively a stakeholder. But, in practice, it is impractical to involve everyone individually, and not all people will wish to participate in the process. Table 4.1 lists a range of key stakeholder interest groups from government, the private sector and civil society that might need to be involved and that should be represented in the strategy process.

Stakeholder analysis can help to:

… so stakeholder analysis identifies key interest groups

- draw out the interests of stakeholders in relation to problems which the strategy is seeking to address;
- identify conflicts of interests (actual or potential) between stakeholders which will influence the riskiness of the strategy, before efforts and funds are committed;
- identify positive relations between stakeholders which can be built upon, and which may enable coalitions of sponsorship, ownership and cooperation;
- identify negative relations between stakeholders which may limit the scope of the strategy or which may influence the design of participation;

Table 5.1 Information-gathering and analytical tools to help strategy decision-making

A: Some tools typically associated with technical 'experts'

Tool/approach	Description/purpose	Advantages	Disadvantages
Land suitability classification	Distinguish and map areas in terms of characteristics that determine suitability for different uses	Distils a mass of physical, biological and (sometimes) economic information into a single index of relative suitability for various land uses	Economic comparisons are rarely made explicit and the relative importance of different factors in calculating the final index may be arbitrary
Impact assessment	Detailed documentation of environmental and social (including health) impacts, adverse effects and mitigation alternatives (see Table 5.4 comparing EIA and SEA)	Explicitly requires consideration of all environmental effects; ability to monetize does not pre-empt enumeration of all benefits and costs of an action	Difficult to integrate descriptive analyses of intangible effects with monetary benefits and costs; not designed to assess trade-offs among alternatives. Reactive/project-focused
Cost-benefit analysis	Evaluates investment projects, based on monetization of net benefits (benefits minus costs)	Considers the value (in terms of willingness to pay) and costs of actions; translates outcomes into commensurate terms; consistent with judging by efficiency implications	No direct consideration of distribution of benefits and costs; significant informational requirements; tends to omit outputs whose effects cannot be quantified; tends to reinforce status quo; contingent on existing distribution of income and wealth
Cost-effectiveness analysis	Selects option that will minimize costs of realizing a defined (non-monetary) objective	No need to value benefits; focus on cost information often more readily available; provides implicit values of objectives (eg marginal cost of increasing by one unit)	No consideration given to relative importance of outputs; degree to which all costs are considered will be important to judgements on 'best' approach
Macroeconomic and behavioural models	Econometric programming models used to simulate linkages between supply and demand, within or across sectors	Dynamic and price-endogenous models allow explicit simulation of feedback effects and price movements; best for sector-level or macro-economic analysis, or very large-scale projects	Tend to require much data and analysis; may be expensive to build and run; often difficult to interpret; opaque to many stakeholders
Multi-criteria analysis	Mathematical programming selects option based on objective functions including weighted goals of decision-maker, with explicit consideration of constraints and costs	Offers consistent basis for making decisions; fully reflects all goals and constraints incorporated in model; allows for quantification of the implicit costs of constraints; permits prioritizing of projects	Results only as good as inputs to model; unrealistic characterization of decision process; must supply the weight to be assigned to goals; large information needs for quantification
Risk-benefit analysis	Evaluates benefits associated with option in comparison with risks	Framework is left vague for flexibility; intended to permit consideration of all risks, benefits and costs; rather than an automatic decision	Too vague; factors considered to be commensurate often are not
Decision analysis (decision trees)	Step-by-step analysis of the consequences of choices under uncertainty	Allows various objectives to be used; makes choices explicit; explicit recognition of uncertainty	Objectives not always clear; no clear mechanism for assigning weights

Scenario development and foresighting	Used to consider the likely environmental, social and economic consequences of current and possible future trends	Helps to illustrate the consequences of taking (and not taking) particular actions or implementing particular policies in the short, medium and longer-term future	Difficulties arise when data are poor and unreliable and trends are disputed. Longer-term scenarios are problematic since there are likely to be many unpredictable changes

B. Tools explicitly designed for stakeholder participation

Tool/approach	**Description/purpose**	**Advantages**	**Disadvantages**
Community-based analysis	Uses a series of exercises to help community stakeholders to share knowledge, review and participate in technical assessments, set priorities and jointly develop options for action	Fundamental to a truly participatory planning effort. Takes the process to the local level where action will need to take place. Serves to engage local inhabitants, focus planning on their needs and gather local information and views	May not provide a sufficiently rigorous/comprehensive analysis and should preferably be combined with technical assessments
Participatory appraisal	Communities actively engage in analysis of local conditions, share knowledge and plan activities, using visual tools such as mapping, matrices etc, with outsiders acting as facilitators	Serves to engage local inhabitants and enables them to 'own' the results and hence assume responsibility for actions identified; seeks out the voices of the poorest people. Often provides more accurate information than conventional surveys and is speedy and cost effective	May not work in every situation. Requires a facilitator who understands the approach, and is trusted by the local people
Key informant interviews	Usually conducted one-to-one and structured around a set of questions to glean insights on a particular issue or policy. Semi-structured interviews are used in participatory appraisal alongside visual tools to improve the level of information and understanding	People are not constrained by the presence of others and can put forward information in their own way. Can be a useful approach with politicians, whose formal engagement can cause problems for others	Does not allow for group debate. Very sensitive to interviewees selected
Market research	Surveys or consultations used to analyse market trends, demand, opinions and opportunities. By telephone, website, interview or at community level using participatory appraisal tools	Can be used to forecast trends, public/consumer opinion and preferences, assess markets for environmental goods and services, and identify options for income generation and enterprise development	Costly if done in-depth
Focus groups	Usually conducted with small groups representing particular neighbourhood/ resource/ policy 'communities' and interests to gain insights about people's perceptions and values	Useful information-gathering tool that can be used to understand particular issues and concerns, good for obtaining qualitative rather than statistical information, and refining preliminary ideas	Setting up a focus group process, including selection of the sample group and facilitation of sessions, requires trained facilitators. Problems associated with nomination/ access to that group. Subject to bias if group small or dominated. Generates 'norms' rather than reality

Table 5.2 The limits of participatory and economic analysis

Economic methods

Limitations	Effect on analysis
Concepts, terms and units imported from Western experience, and are defined and interpreted in different ways by different disciplines	The definitions are critical as they structure how information is both gathered and analysed. For example, the 'household' is frequently the basic unit of analysis, but this means that intra-household and inter-household interactions, which may affect the way a particular resource is valued, are overlooked
Dominated by a set of assumptions that present a limited reflection of 'reality'	Underlying assumption is that individuals and households are driven by welfare (or utility) maximization. This ignores other rational motives such as maximizing chances of survival or fulfilling social duties and rituals
Simplified analysis can be especially misleading in dealing with non-marketed natural resources	For example, during droughts, wild foods may mean the difference between life and death, so their value increases compared with other periods. How can these values be incorporated in long-term planning?
Assumes everything can be valued. Important economic role of some resources may be lost or underestimated	For example, certain species may play a vital role in rituals and so be irreplaceable. Many ecological functions are too difficult or costly to estimate reliably
Data collection methods can result in biases and inaccuracies (even when assumptions are relatively realistic). Interview-based questionnaires are notoriously prone to bias and inaccuracies	If data collected through questionnaires is fed uncritically into analysis, the results may be highly misleading

Participatory methods

Limitations	Effect on analysis
Micro-level detail and local-level diversity combine with an emphasis on social processes	Information generated is too detailed for policy-makers and is difficult to analyse for policy implications (although detailed case-study approach can enrich policy analysis). Some type of sifting process will be necessary to understand the policy implications
Information is frequently context specific. Relative, rather than absolute values are commonly emphasized	This makes quantification difficult as well as comparison between regions or communities
Requires strong facilitation skills	The dependence of the methodologies on good quality facilitation to provide trustworthy and representative findings means that, if good facilitators are absent, the methodology may not provide good quality data
Group discussion generates 'group think' or reversion to conventional wisdom and social norms (similar to focus groups)	Minority opinion and/or 'unpalatable' facts may be neglected
Conclusions may take the form of 'wish lists' with limited attention to conflicts, trade-offs and individual behaviour	Insufficient assessment of the constraints on alternative courses of action, or the extent to which they match individual motivations

Source: Adapted from Dalal-Clayton et al (2000); based on IIED (1998a)

- identify which type of participation is most appropriate for different stakeholders, and the role(s) each might play, at successive stages of the development and implementation of the strategy.

It is, obviously, best if stakeholder analysis is undertaken at the beginning of the strategy process or component activity, to maximize these benefits.

The basic steps in stakeholder analysis are set out in Box 5.4.

Box 5.4 Basic steps in stakeholder analysis

1. Draw up a stakeholder table on an issues basis – identifying the stakeholders (primary and secondary) according to their interests (overt and hidden). Each stakeholder may have several interests in relation to the problems being addressed by the project or process.
2. Develop a relationship matrix – 'mapping' each stakeholder's importance to resolving the issues and their relative power/influence, and indicating what priority should be given to meeting their interests.
3. Identify risks and assumptions affecting the design and success of the strategy. For example, what is the assumed role or response of key stakeholders if the strategy is to be successful? Are these roles plausible and realistic? What negative responses might be expected, given the interests of particular stakeholders? How probable are they, and what impact would these have on the activity?
4. Identify appropriate approaches to stakeholder participation in the strategy; for example, partnership in the case of stakeholders with high importance and influence, consulting or informing those with high influence but with low importance.

Source: Adapted from ODA (1995)

Identifying stakeholders

USING AN ISSUES-BASED TYPOLOGY

An initial stakeholder analysis needs to be conducted at the scoping stage of a strategy, closely related to the issues identified by the scoping process (see Chapter 4 page 77). An issues-based typology will group, for example, all the stakeholders with interests in moving from an over-dependence on fossil fuel, or in tackling deforestation. This approach helps the analysis to be strategic, rather than be too comprehensive. But it helps move an issues analysis on to defining who really must be involved in the strategic process to tackle each issue.

Primary and secondary stakeholders can be distinguished ...

Accepting an issues-based typology, it is then helpful to classify the stakeholders with interests in each issue as primary or secondary:

- *Primary stakeholders* are those who are likely to be affected by the issue or a potential response to it, either positively or negatively; for example, farmers, urban dwellers, landless, children.
- *Secondary stakeholders* are the intermediaries in the process. These will often be distinct institutions; for example, funding, implementing, monitoring and advocacy organizations, government organizations, NGOs, politicians and local leaders. Some key individuals within institutions will have primary (personal) interests as well as formal institutional interests, and thus fall into both categories; for example, when civil servants try to acquire land in a new scheme.

At an early stage in the process a simple diagram of concentric circles of 'primary' and 'secondary' stakeholders (for each issue) can be useful to provoke debate, and provide a focus for subsequent analysis.

Further to this, the basic characteristics of both primary and secondary stakeholders can be profiled according to the following (overlapping) categories (Mayers 2001a):

- *basic demography* – men/women, rich/poor, young/old, ethnic group, etc;
- *location* – rural/urban dwellers, near to the issue/far away, region;
- *ownership* – landowners/landless, managers, staff, trade unions;
- *function* – producers/consumers, traders/suppliers/competitors, regulators, policy-makers, activists, opinion-formers;
- *scale* – small-scale/large-scale, local/international communities;
- *time* – past, present, future generations.

WAYS TO IDENTIFY STAKEHOLDERS

… by different, complementary methods

There are various ways to identify stakeholders; each has its advantages and risks. The analysis must recognize the risks of missing key stakeholders and work to avoid these risks. Using a combination of approaches will reduce the risks associated with any one particular approach (Borrini-Feyerabend, 1997; Higman et al 1999; Mayers 2001a):

- *Identification by staff of key agencies, and other knowledgeable individuals.* Those who have worked in the system for some time can identify groups and individuals that they know to have interests in the key issues and to be well informed about them. However, caution is needed about whether these individuals or groups are truly 'representative' (see below).
- *Identification through written records and population data.* Census and population data may provide useful information about numbers and locations of people by age, gender, religion, and so on. Key line agencies and officials often have useful contemporary and historical records on employment, conflicting claims, complaints of various kinds, people who have attended meetings and financial transactions, among other things. Contacts with NGOs and academics may reveal relevant surveys and reports and knowledgeable or well-connected people.
- *Stakeholder self-selection.* Announcements in meetings, in newspapers, local radio or other local means of spreading information, can encourage stakeholders to come forward. The approach works best for groups who already have good contacts and see it in their interests to communicate. Those who are in more remote areas or are itinerant (eg pastoralists), or are poor and less well educated, and those who may be hostile to other stakeholders, may not come forward in this way. There is a risk that the local elite will dominate the process of self-selection.
- *Identification and verification by other stakeholders.* Early discussions with those stakeholders first identified can reveal their views on the other key stakeholders who matter most to them. This will aid better understanding of stakeholder interests and relations. Different stakeholder groups will have different perspectives about who the key actors are, so identification, for example, just by government officials is inadequate.

STAKEHOLDER REPRESENTATION

Stakeholder groups need true representatives

It is important that individuals involved are 'representative' of their stakeholder group or 'constituency'. True representation will entail constituency agreement of that representation. Otherwise, the best that can be achieved is effective 'sampling'. Whether representation or sampling is done must be made very clear. Key criteria of representation are as follows:

- *Identity:* Does the representative share the views of the group/constituency or will the representatives bring other/multiple identities to the process; for example, tribal/class or political affinities? Where can such other identities help, and where might they hinder representation and outcomes?

- *Accountability:* Was the representative chosen by a particular group/constituency, and does he or she consult with that group regularly? What kind of specificity and sanction has the group attached to the representative's accountability? Some individuals assume a mandate from members of a stakeholder group that is simply not backed up by processes of accountability with those people. Different people have different levels of embeddedness in their groups, and some are therefore more worthwhile representatives than others (see also Chapter 6 on representation).

Identifying stakeholder interests, relations and powers

IDENTIFYING STAKEHOLDERS' INTERESTS

Again on an issues basis, it is necessary to understand:

- stakeholder motivations and interests in relation to the issue;
- the rights, resources, and other means and powers that are available to them (or that are missing) to pursue their motivations and interests;
- the external pressures on them to change;
- their degree of acceptance of need for change – or resistance against it;
- the constraints to making changes, such as regulatory, bureaucratic and resource constraints.

Various methods can help identify stakeholders' interests

Useful *methodologies* for identifying stakeholders' interests (as well as their relationships and powers, below) include (Mayers, 2001a):

- *Brainstorming*, to generate analysis and ideas within a stakeholder group. This takes the form of a session in which 'anything goes', with all points recorded. Later these points can be sorted and prioritized. *Focus groups* can then be convened with particular stakeholders to discuss particular topics.
- *Semi-structured interviews*, in which an informal checklist of issues is used to guide an interview with a stakeholder group, while allowing other issues to arise and be pursued. This approach is particularly useful for cross-checking, identification of common ground, identification of trade-offs and clarification of the decision-making frameworks that the stakeholder group prefers or uses.
- *Digging up existing data* – a variety of recorded materials may shed light on stakeholders' interests, characteristics and circumstances. It is always worth probing and rummaging for reports and recorded information: there is almost always more of it than at first appears, sometimes found in the most unlikely places. If needs be, the other stakeholder analysis methodologies can then be used to verify data uncovered.
- *Time lines* can be prepared with stakeholders of the history of links and impacts of particular policies, institutions and processes, with discussion of the causes and effects of specific changes. For example, time lines have been used in agricultural policy analysis to identify dates when significant events occurred and to relate these to changes in land use patterns (Gill 1998).
- *Diagrams* help many people to get a quick idea of what is being talked about. They can work well to stimulate discussion by both non-literate and literate people. In general, diagrams and visualizations work because they provide a focus for attention while discussing an issue, represent complex issues simply, stimulate ideas and therefore assist in decision-making. Of course, some people do not think or work well in terms of diagrams and prefer verbal discussion with descriptions of real examples and stories.

- *Sustainable livelihoods* analysis also offers a means to analyse stakeholders' livelihood interests (goals and strategies), but in the context of a broader framework for linking together such assessments with assessment of the capital assets available to stakeholders (natural, physical, financial, human and social) and assessment of the policy and institutional environment. It is described further on page 145.

ANALYSING THE RELATIONSHIPS BETWEEN STAKEHOLDERS

Particular sustainability issues are usually characterized by stakeholder conflict or, alternatively, alliances. Such relationships may need to be explored further. Simple matrices describing relations and initiatives between groups could be developed, again on an issues basis; for example, one matrix per issue. It is especially interesting to note where these initiatives might have included previous strategies such as NEAPs, NCSs, poverty reduction strategies and so on. Relationships may be analysed according to the following factors (Mayers 2001b):

Relations between groups can affect their position on issues

- *Function of the relationship* – whether it is legal/contractual; market; information exchange; interpersonal links; or power-building, for example.
- *Strength* of relationships, relating to the frequency and intensity of contact.
- *Formality* of relationships – whether formal or informal relationships, and the mechanisms used.
- *Dependence* between stakeholders: for example, a business-type dependency (with or without a 'referee'); a regulatory-type dependency (with or without incentives and sanctions); a technical dependency (with or without attitudinal changes); or a social dependency (often the most complex of all).
- *Quality* of relationships. This could cover each stakeholder's perception of relationships with other parties – awareness, relevance and timeliness of the relationship; its accessibility; communication media used; or the ability to control the relationship. It could also include an overall assessment, for example in terms of 'good, moderate, conflictual', based on a convergence of the relevant stakeholders' opinions.

In relation to structuring an NSDS, it is useful to ascertain which stakeholders have similar positions on an issue and work together to pursue their common interests – the *'policy communities' or networks* that may exist in formal or informal senses (see Chapter 7, page 242) – and the kinds of initiatives they have worked on together (Box 5.5). Such policy communities can often provide much momentum for a strategy process if linked into it.

ANALYSING STAKEHOLDERS' POWERS

An assessment of the particular powers (or lack of them) of stakeholders is crucial both to an understanding of each sustainable development issue (who are the dominant and the marginalized), and to the structuring of strategy processes (who needs to be involved to remedy problems and realize opportunities). There is a limit to how far progress can be made in either the analysis or the effective change of policy without broaching issues of power differences. Ways need to be found to get some of these power issues 'out into the open' if they are going to be tackled (Mayers and Bass 1999).

Power issues must be understood and tackled

For strategy analysis, a useful first step is to identify the relative *degree* of stakeholders' power, the *source* of that power and the *means* by which power is exercised. Although both participatory and independent means of identification can work, documentary evidence of these types of power is the most effective.

Box 5.5 Policy communities in Pakistan

A 'policy community' is defined as a network of individuals and institutions with interest and expertise in a particular area, and therefore a stake in the process of decision-making regarding that area. It is based on the idea that policy-making is not a monolithic exercise located in one ministry or agency. It involves cooperation between governmental agencies as well as non-government entities. The decision-making process invariably reflects the relative political influence of these groups and involves political negotiations and compromises between them (Banuri and Khan 2000).

Analysis of the context for sustainable development in Pakistan (as part of analysing the impacts of the National Conservation Strategy) revealed six dominant communities or networks, with a seventh emerging:

(a) *Economic and trade liberalization networks*, consisting almost exclusively of economists and business interests promoting market solutions.
(b) *The poverty eradication network* which is united around community empowerment, development and institution building.
(c) *The agricultural yield improvement network* which consists of agronomists united by the green revolution's promise of dramatic yield increases.
(d) *The energy development network*, united for a long time around the unrealized potential of hydro power.
(e) *The urban agenda network*, united almost exclusively by the vision of real estate development.
(f) *The international NGOs and donor networks* which combine a multitude of visions, ranging from pure conservation, social transformation, development effectiveness, and opening up markets and business opportunities.

By and large, most of these policy communities operate at cross-purposes much of the time, with limited consideration of sustainable development. Community development and conservation/environmental NGOs – which form the backbone of the emergent (seventh) environmental *and sustainable development policy network* – still have a major role to play in bridging the gaps between other powerful policy community networks. 'This should become one of the stated core objectives of the NCS, and not an incidental one.'

Source: Hanson et al (2000)

The nature of power varies

Often the elements of 'power' will need to be unpacked. Stakeholder power is not a single 'currency' that can be expressed, like energy, in kilowatts. It is important to address the question of how stakeholders gain or lose power to influence the direction of the policy process. Filer and Sekhran (1998) identify four different types of power:

- *Managerial power*, the capacity to *control* the activities of other stakeholders, and thus to determine the quantity and quality of their outputs.
- *Executive power*, the capacity to *meet the needs* and demands of other stakeholders, thus increasing one's authority over them.
- *Bargaining power*, the capacity to *extract* resources or concessions from other stakeholders, by some combination of force and persuasion.
- *Positional power*, the capacity to *secure* the sympathy and support of other stakeholders, on the assumption of some common interest.

Since each group of stakeholders is often internally divided, it is also possible to distinguish between *external* forms of power, which are exercised by one group of stakeholders over other groups of stakeholders, and *internal* forms of power, which are exercised by some members of a stakeholder group over other members of the same group. The power of each group can then be analysed and an indication of their overall 'weight' within the policy process given – the sum of all their influences over the direction of that process.

COMPARING STAKEHOLDERS' POWERS WITH THEIR POTENTIAL FOR SUSTAINABLE DEVELOPMENT

Mapping power helps in understanding the potential contribution of groups to sustainable development

The next challenge is to relate the power of stakeholders to their *potential* to affect, or be affected by, strategies and related policies, institutions and initiatives. Assessing which individuals and groups have power over which others will help to piece together power chains – often the potential to affect policy, institutions and initiatives is not derived through one direct link, but through a chain. Of particular concern are those stakeholders with high potential for sustainable development but little power (such as landless people). If progress towards sustainable development is to be made, some stakeholders need to be empowered to make more positive contributions, while others need to be restrained from making destructive contributions. A tabular format can be used to compare power, as illustrated in Table 5.3.

Table 5.3 Stakeholder power analysis of a particular issue (or policy or institution): suggested table for comparisons

SD issue	Stake-holders	Main interests	Powers	Potentials	Relation with others	Net impact	Options/ways forward

An instructive example of mapping power and potential comes from Malawi where the Coordination Unit for the National Forestry Programme (NFP) recognized that stakeholders have very different levels of power to take action, and they vary in their importance or potential for good forestry and livelihoods. To provoke debate at the meetings of the multi-stakeholder Forest Forum, the Coordination Unit developed a basic 'ranking' of stakeholder groups according to power and potential (Table 5.4).

Figure 5.1 attempts to show the rankings from Table 5.4 in a more striking visual way. It shows the main stakeholder groups in Malawi's forest goods and services by circles – the larger the circle, the greater the number of people in the group. The centres of the circles are 'plotted' against the two axes – power and potential. Thus stakeholders might be grouped as follows in relation to power:

- Top LH corner – need to influence these stakeholders.
- Top RH corner – stakeholders currently matter most to the issue.
- Bottom LH corner – stakeholders marginal to the issue.
- Bottom RH corner – need to empower these stakeholders.

Whose needs should have greater weight in strategy decisions? – a tricky issue

Another way of combining analysis of power and potential – and thereby improving the identification of which stakeholders need to be involved in a strategy – is to ask 'who counts most?' Indeed, just as it can be necessary to identify which issues are priorities (discussed on page 160), it may frequently be necessary to ask which stakeholder groups count most in relation to an issue, which are dominant, and which groups are marginalized? In other words, whose needs and opinions should have greater weight in strategy decisions? This is tricky ground, and agreement on criteria should be sought early in the strategy process. An example is presented in Box 5.6. The result can often include a definition of *'marginalized stakeholders'* – groups who are affected by an issue and should otherwise be thought of as primary stakeholders, but are marginalized from decision-making processes (eg the old and the poor, women, children and itinerant groups such as pastoralists). Such a definition can really help the strategy steering committee and secretariat to target participation and other activities.

Table 5.4 Mapping power and potential of stakeholders: Malawi's National Forestry Programme

Stakeholder group	Size of group	Potential to contribute to good forestry	Power to contribute to good forestry
Smallholders	17	17	1
Organized users and groups at community level	16	16	2
Fuelwood and charcoal sellers and traders	15	1	4
Chiefs and traditional authorities	14	10	5
Pitsawyers	13	8	6
Small non-timber enterprises	12	9	3
Ministry of Agriculture	11	12	12
District Assemblies	10	2	9
Forestry Department	9	15	15
Other departments (wildlife, environment, energy)	8	6	11
Estate owners (tobacco)	7	3	8
NGOs	6	14	10
Wood industries	5	5	13
Plantation companies (timber, rubber and tea)	4	7	14
Investment Promotion Agency, Privatization Commission	3	4	7
Donors	2	11	16
Ministry of Natural Resources and Environmental Affairs	1	13	17

Notes: (a) 1 = smallest, 17 = highest values in each category: size, potential and power

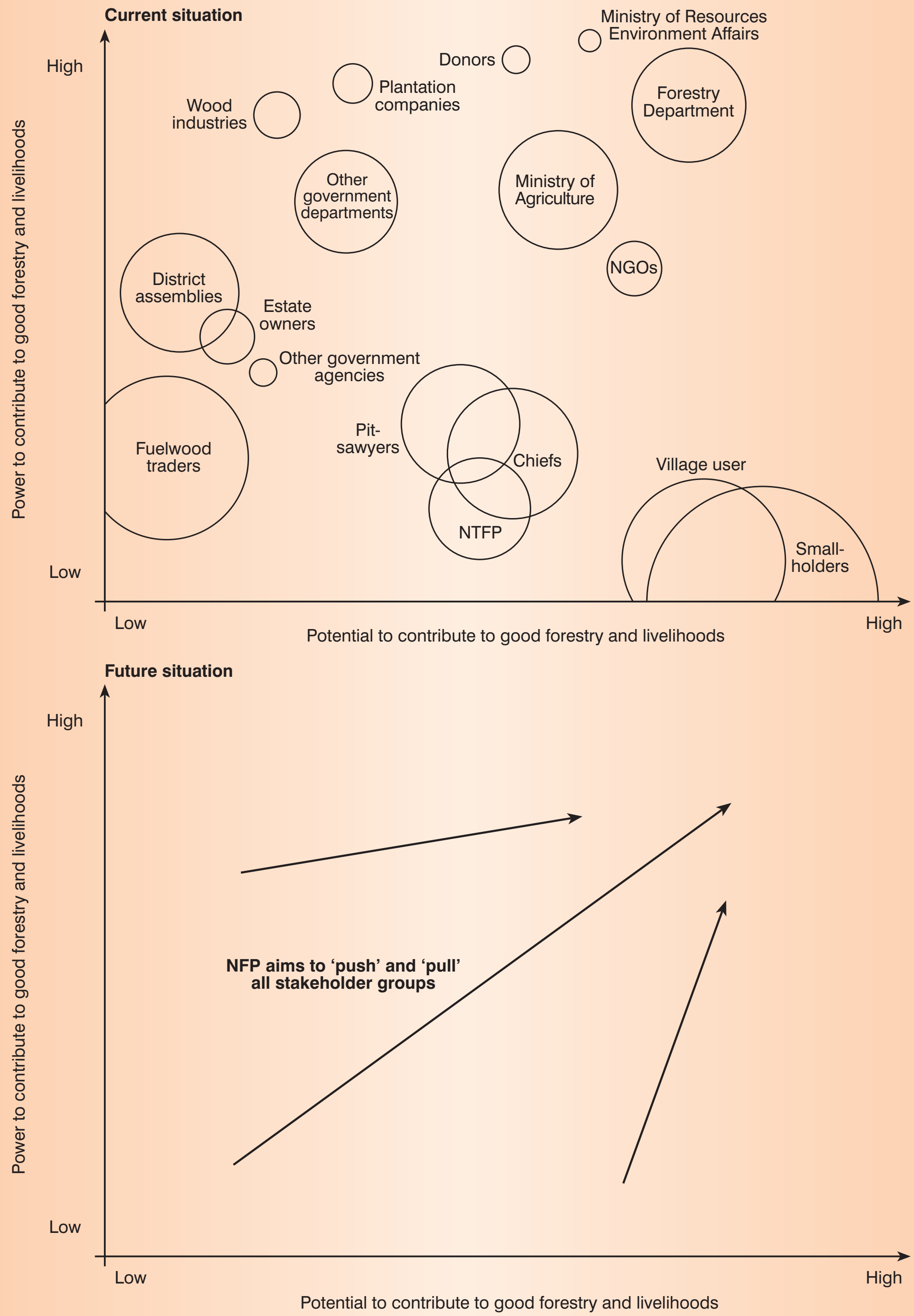
Source: Mayers et al (2001)

Limitations of stakeholder analysis

Finally, there are limitations to stakeholder analysis. In brief, these are (Mayers and Bass 1999):

Stakeholder analysis has some drawbacks …

- Stakeholder groups overlap – and even within one group, people take on multiple identities.
- Stakeholder groups change over time – and need the freedom to do so; 'pigeon-holing' them may restrict this.
- There are other risks to do with categorization and representation – some stakeholders may get under-represented or misunderstood.
- Differences and conflicts are based on different values – no common ground may, in fact, be apparent.
- Where sustainability analysis reveals information about less powerful groups, this can be dangerous as it might lead to manipulative, undermining and inequitable actions on the part of the more powerful groups in the process.
- Stakeholder analysis is an information tool, rather than one for decision-making. It can identify the heart of the problem – but it cannot provide easy solutions. Challenges raised are:
  - What is the common ground for compromise?
  - How to manage conflicts?
  - Which stakeholders' interests to prioritize?



Source: Mayers et al (2001)

Figure 5.1 Stakeholder groups' size, potential and power to contribute to sustainable development

… so it must be suitably managed and monitored

Because of these possible drawbacks, it is important that strategy stakeholders are clear about the purpose of stakeholder analysis and agree both the desirable and the undesirable outcomes, so that the analysis can be suitably managed and monitored.

We have stressed in this section that stakeholder analysis for NSDSs should generally be organized according to sustainable development issues, rather than according to stakeholder group. In the next section, we look at how to identify and analyse issues of environmental, economic and social sustainability. The following section then addresses ways to analyse issues of policy and institutional processes.

Box 5.6 'Who counts most?' The tricky issue of stakeholder priority

In response to the challenge of redressing imbalances between stakeholders in access to forestry decisions, Colfer (1995) has developed an approach for ensuring that local forest actors are fully identified and weight is accorded to them, corresponding to their:

- *proximity* to forests, woodlands or trees on farms;
- *dependence* on forests for their livelihoods (ie where there are few or no alternatives to forests for meeting basic needs);
- *cultural linkages* with forests and uses of forest resources;
- *knowledge* related to stewardship of forest assets;
- *pre-existing rights* to land and resources, under customary or common law;
- *organizational capacity* for effective rules and accountable decision-making about forest goods and services;
- *economically viable forest enterprise* based on environmental and social cost internalization, bringing equitable local benefits.

Colfer strongly suggests that an 'inverse' criterion should also be used; that is, if a local group has a *power deficit it* should be weighted more heavily (to make up for such a deficit). Conversely, some stakeholders may have considerable levels of power and influence, as well as interests that may adversely affect the abilities of other stakeholders to pursue good forestry. In such circumstances, an approach is needed which weights stakeholders according to the degree to which their actions should be *mitigated* or *prevented*. This is, of course, difficult ground. Finally, one might also want to add an assessment of the degree to which people are risk-bearers (of risks taken by other groups).

Source: Mayers and Bass (1999)

Approaches to measuring and analysing sustainability[3]

The purpose of measuring and analysing sustainability is to answer five questions:

1. How well is the ecosystem in question?
2. How are people affecting the ecosystem?
3. How well are the people (including current and future generations)?
4. Is their well-being fairly shared?
5. How are these questions connected?

Measuring society's progress towards sustainability helps to identify priority issues

This information is essential for determining the progress of a society towards sustainability, its main strengths and weaknesses, and the priority issues to be addressed by the NSDS. The information equips decision-makers to focus on the priorities without losing sight of the other components of sustainable development that, if not (yet) priorities, are also crucial for its achievement. It also provides the basis for monitoring and evaluating the effectiveness of the strategy and adjusting it as necessary (Chapter 10).

3 This section has benefited much from material provided by Robert Prescott-Allen.

The three main approaches to measuring and analysing sustainability are:

- *accounts* (providing data) (below);
- *narrative assessments* not based on indicators (page 135);
- *indicator-based assessments* (page 135).

As Table 5.5 shows, these differ in their potential for:

Sustainability analysis methods have different potentials

- transparency (ease of detecting value judgements and construction of the assessment);
- consistency over time (comparability of successive assessments);
- participation (the more technical the method, the less scope for participation);
- usefulness for decision-making (clarity with which performance and priorities are revealed).

No approach is perfect. All can profitably be supplemented by one or more *contributing measurements and analyses* (page 138).

Accounts

Accounts use a narrow set of indicators

Accounts are constructions of raw data, converted to a common unit (such as money, area or energy). Most cover highly important but small aspects of sustainability and are described under 'Contributing measurements and analyses' (page 138). Generally speaking, they refer to one or a narrow set of indicators and include the system of national accounts (page 141) (covering the market economy), the ecological footprint (covering resource consumption), and energy and material accounts (covering physical exchanges between the economy and the environment). The most comprehensive accounts sum many aspects of the economy, society and the environment into a single statement.

The Genuine Progress Indicator (GPI), for example, starts with personal consumption expenditure (taken from the national accounts). It then makes a series of adjustments to account for the negative effects of economic activity or factors that are ignored by the GDP (such as unequal income distribution, net foreign lending or borrowing, cost of consumer durables), social costs (crime, automobile accidents, commuting, family breakdown, loss of leisure time, underemployment) and environmental costs (household pollution abatement, water pollution, air pollution, noise pollution, loss of wetlands, loss of farmlands, depletion of non-renewable resources, long-term environmental damage, ozone depletion, loss of old-growth forests). Finally it adds some benefits ignored by the GDP (value of housework and parenting, value of volunteer work, services of consumer durables, services of highways and streets, net capital investment).

Comprehensive accounts are directly comparable with GDP, but have disadvantages

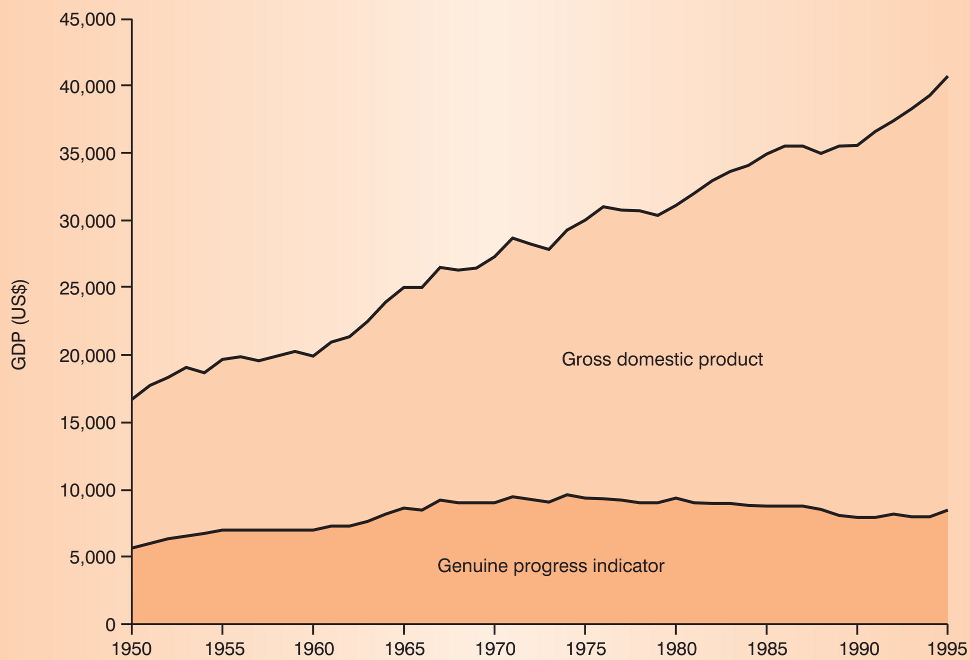
The advantage of the GPI and similar comprehensive accounts is that they are directly comparable with the GDP, the most widely used measurement of national performance (Figure 5.2). But accounts have several disadvantages, particularly as a strategic tool for assessing sustainability:

- Many costs and benefits have no market value; converting them to monetary units involves assumptions, extrapolations and judgements that distort the results; and some costs and benefits, such as loss of biodiversity, are so hard to evaluate that they are omitted.
- The assumptions, judgements and omissions are difficult to detect, and the construction of the accounts is almost impossible for non-specialists to follow.
- Although values strongly influence the final outcome, calculation of the accounts is highly technical and leaves little room for wide stakeholder participation.

Table 5.5 Three main approaches to measuring and analysing sustainability

Approach:	Accounts (page 132)	Narrative assessments (page 135)	Indicator-based assessments (page 135)
Examples:	Index of Sustainable Economic Welfare Genuine Progress Indicator	State of environment reports World Development Report	Well-being Assessment Dashboard of Sustainability
Potential for transparency	Low	Medium	High
Potential for consistency	High	Low	High
Potential for participation	Low	High	Medium
Usefulness for decision-making	Medium	Medium	High

Although accounts produce a strikingly clear picture of overall performance – or 'genuine progress' – they do not reveal so clearly the main constituents of that performance: it is difficult to tell which priority issues to focus on to close the gap between the GPI and the GDP. This limits the usefulness of accounts for strategy development.



Source: www.rprogress.org/projects/gpi/

Figure 5.2 Gross domestic product versus Genuine Progress Indicator: United States 1950–1999 (in 1996 US dollars)

Narrative assessments

'Narrative assessments' are familiar and flexible …

Narrative assessments combine text, maps, graphics and tabular data. They may use indicators, but are not built around them and the indicators used may change from one reporting period to another. They include standard state of environment reports (Box 10.8, the World Bank's *World Development Report*) and a wide variety of other reports, and represent the most familiar approach to measurement and analysis. Their strength is their familiarity and flexibility. The potential for participation is great, because the assessment can be tailored to the technical skills of participants. Compilers can devote their attention to topics on which they have information and choose whatever communication device they deem most suitable for each topic.

… but this has its drawbacks

However, this flexibility has pitfalls. Unsystematic choice of topics coupled with uneven treatment can mask gaps in coverage and obscure priorities: what topics have been omitted? Has a topic been left out because it is unimportant or because of lack of data? How does one topic relate to another? How can one compare the importance of a topic covered by an anecdote-rich case study with one covered by extensive statistical analysis? The topics covered, or the way they are covered, may change between reporting periods, preventing the identification of trends. Limited transparency and consistency reduce the usefulness of these assessments for decision-making, particularly for strategy development and monitoring.

Indicator-based assessments

Indicator-based assessments are more transparent …

… and can be compared over time

Like narrative assessments, indicator-based assessments may include text, maps, graphics and tabular data, but unlike them they are organized around indicators (see Box 5.7) – generally speaking, a broader set of indicators than accounts (page 133). A great deal of attention is paid to choosing them systematically. Indicators enable assessments to be comprehensive yet selective: because they can be selective, they are better equipped than accounts to cover the wide array of issues necessary for an adequate portrayal of human and environmental conditions. Systematic procedures for choosing indicators lay bare the selection and arrangement of issues covered by the assessment and the values involved, and make the construction of indicator-based assessment more transparent than that of accounts or narrative assessments. By employing the same set of indicators over time, later indicator-based assessments can be compared with previous ones, providing more consistent coverage from one assessment/reporting period to another. Comprehensive and consistent coverage, together with systematic organization of issues and their indicators, enable priority issues and strengths and weaknesses of performance to be clearly identified. This makes indicator-based assessments more useful than other approaches for decision-making and hence for strategy development. 'Deciding what to measure: a framework of parts and aims' on page 154 discusses the main steps in developing an indicator-based assessment.

Participants should be involved in deciding what to assess

Participation by decision-makers and stakeholders is necessary to ensure that the assessment incorporates their values and addresses their concerns. Participants need to have a major say in what is assessed and in deciding questions of value. At the same time, the team undertaking the assessment has a responsibility to make sure that the assessment is technically sound and withstands scientific scrutiny. However, the technical demands of indicator selection impose constraints on participation. In effect, the assessment must be designed jointly by participants and technicians.

Although indicator-based assessments are potentially more transparent, consistent and useful for decision-making than other approaches, whether they fulfil their potential depends on how well they are designed and executed.

Assessments can use different numbers of sub-systems …

Indicator-based assessments of sustainability differ chiefly in the number of subsystems into which they divide the system (the assessment area), the number of levels between subsystem and indicator and whether they produce indices (compound indicators) of the state of the system and its subsystems (Table 5.6).

Box 5.7 What is an indicator?

An indicator is something that represents a particular attribute, characteristic or property of a system (Gallopín, 1997). More narrowly, as used here, an indicator is a measurable part of a system. For example, health is not an indicator because it cannot be measured directly, but life expectancy at birth, the child mortality rate and the incidence of specific diseases can be measured and therefore can be indicators.

An indicator that combines or aggregates several parts is called an index (plural: indexes or indices). An index may be a *compound indicator* combining several lower-level indicators. Examples are the Human Development Index, the Well-being Index, and a city's Air Quality Index. Or an index may be a *composite indicator* made up of many components that are not indicators in themselves. Examples are the gross domestic product, the consumer price index, the Dow Jones industrial average, and the ecological footprint.

Table 5.6 Indicator-based assessments of sustainability

Type	Number of subsystems	Number of levels between subsystem and indicator	Indices of the state of the system and subsystems?
Well-being Assessment (Figures 5.4, 5.5)	2: ecosystem, people	2–4	Yes
Dashboard of Sustainability (Figure 5.6)	3: environment, economy, society	1	Yes
Dashboard of Sustainability for CSD	4: environment, economy, society, institutions	2	Yes
CSD indicators of sustainable development	4: environment, economy, society, institutions	2	No
Global Reporting Initiative Sustainability Reporting Guidelines	4: environment, economy, society, integrated	1–3	No

The division into two subsystems ensures that assessments treat people and the environment equally and focus on the central question of sustainable development: how to achieve high levels of human well-being and ecosystem well-being together? Increasing the number of subsystems by subdividing the human side reduces the weight given to the environment from a half to a third (three subsystems) to a quarter (four subsystems) (Figure 5.3). The advantage of three subsystems is the prominence given to the economy, still the main preoccupation of decision-making. However, which aspects of human well-being are 'economy' and which 'society' can be hard to tell and depend on particular cultural perspectives. The separation of 'economy', 'society' and 'institutions' is even more arbitrary and confers no advantage other than its current acceptance by the United Nations Commission on Sustainable Development (CSD). An 'integrated' subsystem is superfluous because the 'integrated' indicators suggested by the Global Reporting Initiative (www.globalreporting.org) could be assigned to one of the other subsystems or could be generated more informatively as indices of the state of the subsystems or the system as a whole.

… and this determines their robustness and user-friendliness

The number of levels between subsystem and indicator is a major factor in both the robustness and the user-friendliness of an assessment method. Too few levels make it hard to trace the logic behind the choice of indicator – what aspect of the subsystem the indicator represents and how fully and directly it represents that aspect. Too many levels risk losing the user in a convoluted series of links between subsystem and indicator.

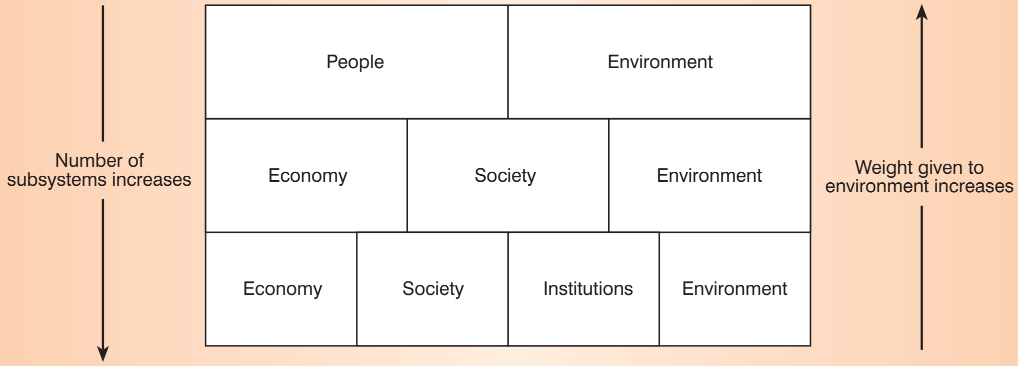


Figure 5.3 Environmental weight declines as the number of human 'subsystems' increases

There are hundreds of sustainability indicator sets

Given the broad scope of sustainable development, a large number of indicators is inevitable but presents an enormous communication problem. The International Institute for Sustainable Development (IISD) notes the key dilemma of needing both comprehensive coverage and simple messages and presentation:

> *From those developed for rural communities to those for the United Nations, hundreds of sustainability indicator sets have been created for and presented to their respective audiences. Still, they have far to go before they can claim to be widely used. Most sustainability indicators come as large, unwieldy reports, crammed with complex charts and graphs. Although useful to policy professionals and academics, most indicator sets are not practical for the media and public. In order to build support for and an understanding of indicators, there must be a process for indicators to be legitimized through some form of public consultations or trial application.*

The growing ranks of indicator projects and professionals worldwide face two challenges that seemingly contradict each other:

- Growing complexity. As our understanding of the complexity of sustainability grows, how do we manage the mountains of data required to monitor it?
- The demand for simplicity. Since public education and resulting political action are seen increasingly and urgently as the purpose for creating indicators, how do we present them in ways that are simple, elegant and effective, without compromising the underlying complexity?

Indices are more easy to understand …

A single indicator of sustainable development is an impossible dream (Box 5.8). The best way to overcome this problem is to combine the indicators into indices. Assessments that do not combine their indicators into indices are extremely hard to interpret. Assessments that do, can communicate their main findings very readily. When indicators are combined into indices, they can provide a clear picture of the entire system, reveal key relationships between subsystems and between major components, and facilitate analysis of critical strengths and weaknesses. No information is lost, because the constituent indicators and underlying data are always there to be queried.

Well-being Assessment combines ecosystem indicators into an Ecosystem Well-being Index (EWI) and human indicators into a Human Well-being Index (HWI), which are then combined graphically into a Well-being Index (WI) – the intersection of the EWI and HWI on the Barometer of Sustainability (Figures 5.4 and 5.5).

Box 5.8 The quest for a single indicator of sustainable development

Complex problems of sustainable development require integrated or interlinked sets of indicators, or aggregations of indicators into indices. High-level decision-makers – government ministers, foundation executives, heads of corporations – routinely ask for a small number of indices that are easy to understand and use in decision-making. Many concerned with sustainable development voice their desire for a single indicator to compete with the enormous political power of the Gross Domestic Product, a single number that provides information about the total market value of production and services in a country as a single number. But many are sceptical that a single number could assess something as complex as sustainable development.

Most indicator experts believe that searching for a single indicator of sustainable development is something like the quest for the unicorn. It is a myth to think that one number – even one that vastly improved on the GDP as a proxy for overall national well-being – could have any real functional value as a policy tool. But many also acknowledge that the attempt to create an index of sustainable development may be useful because it would force a concerted effort to present the complexity of sustainable development more simply. Even a modestly successful effort by presenting a handful of aggregated indices could introduce a generation of policy and decision-makers to the goals of sustainable development.

Source: www.iisd.org

The Dashboard of Sustainability comes in two versions. The standard version combines environmental indicators into an Environment Index (EnI), economic indicators into an Economy Index (EcI) and the social indicators into a Society or Social Care Index (SI), which it then combines into a Policy Performance Index (PPI). The version for the indicator set of the CSD (Figure 5.6) combines institutional indicators into an Institutional Index (II) and then combines the EnI, EcI, SI, and II into a PPI.

… and can be shown graphically

By combining indicators into indices and displaying the indices graphically, both Well-being Assessment and the Dashboard of Sustainability show how close the society concerned is to sustainability, the state of people (socio-economic conditions) and the ecosystem (environmental conditions), and the main strengths and weaknesses of performance.

The last decade has seen considerable efforts by governments, NGOs and multi-stakeholder groups to develop indicator-based assessments of sustainable development. Some cover the full sweep of sustainability. Most tend to pay more attention either to human aspects or to the environment. IISD provides a compendium of indicator initiatives at www.iisd.org and some examples are listed in Box 5.9.

Contributing measurements and analyses

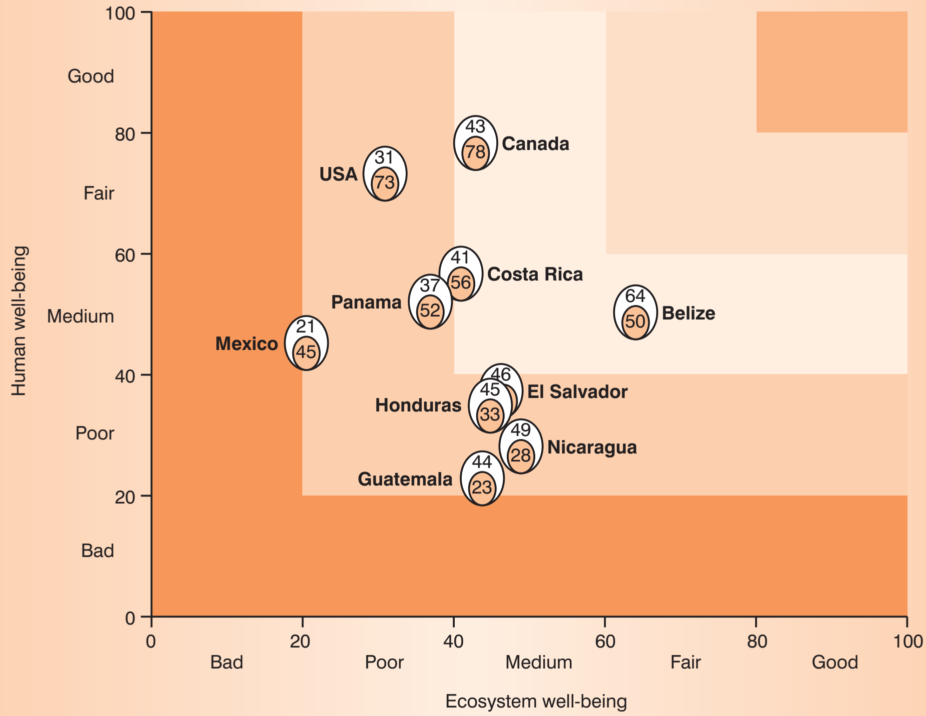
Other analytical techniques are also useful

It is not the intention of this resource book to offer the complete 'how to' advice on all kinds of analytical techniques for getting to grips with particular issues. Table 5.1 lists many of them and their pros and cons. The following have been shown to be useful. The final four techniques (policy influence mapping; problem trees; strategic environmental assessment; and community-based issue analysis, see pages 147–153) are particularly useful as they: bring together several dimensions of sustainable development; help get close to an understanding of underlying causes; offer insights as to possible solutions; and are amenable to participation – or at least make the results broadly understandable to a wide group of 'non-expert' stakeholders.

SPATIAL ANALYSIS

Maps and geographical information systems are essential tools

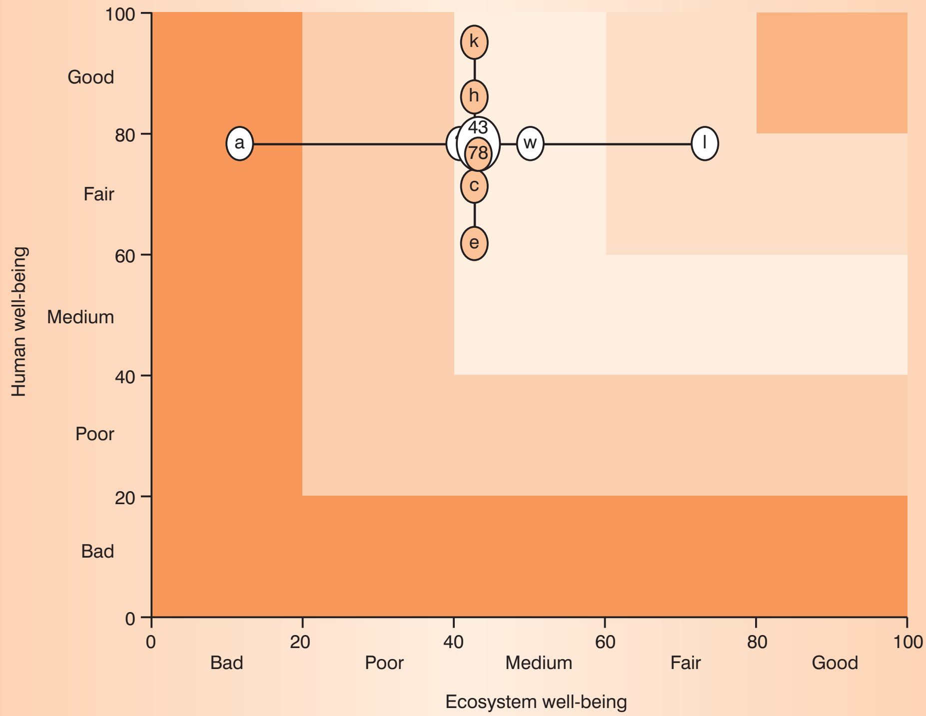
Spatial analysis using GIS is indispensable for strategies that deal with land use planning, coastal zone management, natural resource management, biodiversity conservation, urban planning or any other decisions about the allocation and management of land and water. Maps are by far the best way of showing the location, size, pattern, and ecological, economic or cultural values and characteristics of land areas and water bodies, and of displaying and evaluating conflicts and compatibilities between different uses.



Source: Prescott-Allen (2001)

Figure 5.4 Group Barometer of Sustainability, showing the well-being of North and Central America

The Human Well-being Index (HWI) is in the yolk of the egg; the Ecosystem Well-being Index (EWI), in the white. (El Salvador's HWI is 36 and EWI 46.) The Well-being Index (WI) is the position of the egg – the point on the Barometer where the HWI and EWI intersect. Sustainability is the square in the top right corner. Note that the Barometer clearly shows the relationship between human and ecosystem well-being, the wide spread of performance among countries, and the distance to sustainability. Belize was assessed on fewer indicators than the other countries: a fuller assessment might move its position to between Costa Rica and El Salvador.



Note: From left to right are 'barometers' of environmental, social, economic and institutional conditions.

Source: Prescott-Allen (2001)

Figure 5.5 Individual Barometer of Sustainability, showing the well-being of Canada

Orange circles (vertical axis) are the points on the scale of the human dimensions (major components of the HWI):

c = community; e = equity; h = health and population; k = knowledge; w = wealth.

White circles (horizontal axis) are the points of the ecosystem dimensions (major components of the EWI):

a = air; l = land; r = resource use; s = species and genes; w = water.

Some dimensions are hidden by the egg (wealth, species and genes, resource use). The dimensions that need most attention are air (reduce carbon emissions), resource use (reduce energy consumption), and species and genes (expand habitat protection for wild species, and conserve agricultural diversity).

Box 5.9 Examples of sustainable development indicator initiatives

Worldwide

UNEP: Project to measure states of and trends in the environment and guide policy-making towards sustainable development, in implementation of UNEP Environmental Observing and Assessment Strategy. Development of indicators in specific sectors; approaches to aggregation of indicators; use of indicators in state-of-the-environment reporting. Indictor sets issued in 1997, 2000 and 2001 (www.unep.ch/earthw.html)

World Bank: (a) The Bank's annual World Development Indicators (WDI) includes 800 indicators in 75 tables, organized in six sections: world view, people, environment, economy, states and markets, and global links. The tables cover 148 economies and 15 country groups – with basic indicators for a further 58 economies (www.worldbank.org/data/wdi2000); (b) The Environmental Economics and Indicators Unit has developed indicators of environmentally sustainable development and environmental performance (for WB projects) (www-esd.worldbank.org/eei)

UNDP: Human Development Reports published since 1990, presenting the Human Development Index (HDI) as a measure of human development in individual countries (see Box 5.12) (www.undp.org)

OECD: Programme to develop a core set of (and supporting sectoral) environmental indicators initiated in 1990 (based on policy relevance, analytical soundness and measurability) (www/oecd.org//dac/Indicators/index.htm)

Dow Jones Sustainability Group: Indexes (one global, three regional and one country) based on the world's first systematic methodology for identifying leading sustainability-driven companies worldwide. (www.sustainability-index.com)

World Resources Institute: Project on highly aggregated, policy-relevant environmental indicators – developed map-based indicators of biodiversity and land use; and indicators of material flows (national, sectoral and company levels) (www.wri.org)

Hart Environmental Data: Comprehensive website with a database of indicators-related projects and resources to help people and organizations with their indicator research. Specializes in community indicators (www.subjectmatters.com/indicators/Indicators/)

National/provincial

United States: Interagency Working Group on Sustainable Development Indicators developed experimental set of 40 indicators to encourage a national dialogue towards developing a set of national indicators (www.sdi.gov/reports.htm)

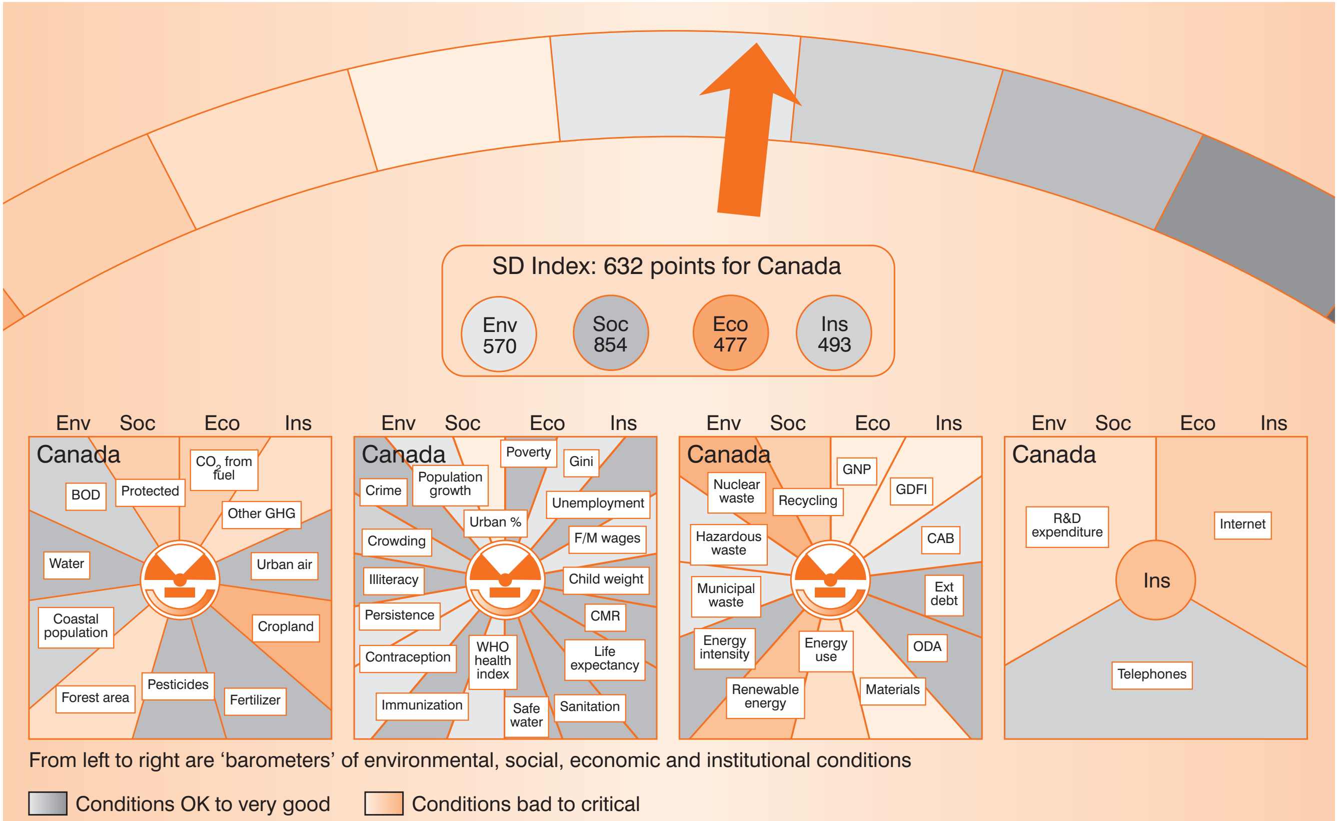
Finland: Finnish Environment Institute developed sustainable development indicators for use at national level – 20–30 indicators in each of four categories: environmental, economic, social, conflict (www.vyh.fi/eng/welcome.html)

United Kingdom: Department of the Environment, Food and Rural Affairs developed core set of 150 (and 15 headline) sustainable development indicators to be central to future progress reports – take an economic-social-environmental-resource model while recognizing interactions between them (www.sustainable-development.gov.uk)

County, municipal, local area, community-based

- **Lancashire County Council, UK:** Second Green Audit incorporates 40 sustainability indicators for the county (www.la21net.com/)
- **City of San Jose, California:** The City Policy and Planning Division developed 52 quantifiable indicators of sustainability in nine categories as a step towards creating a centralized, coordinated environmental data system for performance measurement and public information (www.ci.san-jose.ca.us/esd/)
- **Hamilton-Wentworth, Ontario, Canada:** Sustainability indicators to monitor progress towards goals of city's Vision 2020 – developed through community consultation process using workbooks (www.vision2020.hamilton-went.on.ca/)
- **Sunrift Center for Sustainable Communities, Minnesota, USA:** Developed the Flathead Gauges to identify/quantify key components of sustainability in Flathead County, and to measure trends. Involved public meetings, citizen survey and feedback from individuals and organizations (cdaly@netrix.net)
- **Sustainable St Louis:** 'Measure of St Louis' project assists citizens to develop and monitor a set of community-defined indicators of sustainable development (Contact: Claire Schosser, PO Box 63348, St Louis, MO 63163, USA; Fax: +1-314-773-1940)
- **Integrative Strategies Forum, Washington, DC:** The Metro Washington Community Indicators Project is a voluntary initiative, promoting the development and use of community indicators as part of a wider sustainability planning process (jbarber@igc.org)
- **Sustainable Northern Ireland Programme:** An NGO working with communities and local authorities to promote Local Agenda 21 and sustainable development in Northern Ireland. Helped several councils to develop initial sets of indicators to raise public awareness about sustainability (Contact: Michael@snipl.freeserve.co.uk)

Source: www.iisd.org



Source: www.iisd.org

Figure 5.6 The Dashboard of Sustainability: an example for Canada

GIS is also an essential tool for developing spatial indicators, such as the percentage of each ecosystem type that is natural, modified, cultivated or built; the status and trends of ecosystem diversity; the extent and security of ecosystem protection; the extent and severity of land degradation; the degree of conversion and modification of inland water systems; and the spread and intensity of marine pollution and habitat degradation. Because the system comprises information of different types (eg soil fertility, flood hazard), it can also be used to highlight possible correlations that may suggest significant links. It can generate scenarios by manipulating the variables.

There is an inherent danger that the aura of technical sophistication can sway some stakeholders to treat the information more seriously than information that cannot be so presented. There are also dangers that this can obscure the assumptions and uncertainties inherent in the approach. However, recent developments have made GIS more accessible to participatory approaches. Box 5.10 presents an example from Australia that illustrates the pros and cons.

SYSTEM OF NATIONAL ACCOUNTS (SNA)

National accounts are the records of asset changes, income and expenditure that governments compile routinely to track the activity of their national economy, analyse its structure and performance, decide economic policies, and compare the economies of different countries. The SNA measures the performance not of the economy as a whole but of the market economy – the production of goods and services that are owned and traded and so have a monetary value – plus certain goods and services that are not traded but for which a market value can be inferred: goods produced by farmers for their own consumption, the equivalent rental value of owner-occupied dwellings and government services.

National accounts are a source of informative and influential indicators

Box 5.10 The use of GIS in achieving Regional Forest Agreements, Australia

For years, stakeholder conflict had been brewing about how to use Australia's native forests – for woodchip exports or for conservation. Regional Forest Agreement processes were initiated to negotiate informed outcomes. The process offered a combination of consultative mechanisms and specialist assessments, coordinated by a task force of specialists. These included:

- ecological or biodiversity assessment;
- cultural heritage assessment;
- indigenous heritage assessment;
- social assessment;
- wood resources.

Geographic information systems dominated the whole phase of integrating the information from these processes. They provided a means for storing and displaying the various layers of information and creating composites of them, and a basis for various modelling exercises. They were ideal for the ecological and biodiversity aspects, which were largely driving the process, and were also quite well suited for recording the various types of heritage sites.

'Decision support models' were also developed. They endowed a high level of credibility to the content of the assessments and the technical aspects of integration. Importantly, they provided the 'language' in which negotiations were conducted, which made the inherent conflicts amenable to bureaucratic processes and thus potentially governable. However, many factors were left out of these models, and major shortcomings emerged in the attempts to ensure 'full and comprehensive integration'.

Despite the availability of the highly sophisticated GIS, models and databases and attempts at all-inclusive public consultation, compromises have been difficult to reach. Two of the important sources of conflict – indigenous land rights and local economic development – are by-passed by the present process. The immediate beneficiaries are the woodchip export companies who are freed of export controls. Participatory mechanisms need to be further developed to handle genuine negotiation with community and 'middle' levels, with a similar degree of professionalism as has been accorded to the GIS.

Source: Dargavel et al (1998)

It is not suggested that such accounts are compiled expressly for a strategy but, where they are available, they are a source of highly informative and influential indicators, notably gross domestic product (GDP: the total value-added of enterprises operating in the country concerned, regardless of whether owned by residents or non-residents) and gross national product (GNP: the total value-added of enterprises owned by residents of the country concerned, regardless of whether the money comes from domestic or foreign operations).

National accounts also provide basic data for broader accounts such as the Genuine Progress Indicator (page 133) and recalculations of specific aspects of the economy such as genuine saving (below).

GENUINE DOMESTIC SAVINGS

'Genuine domestic savings' show what is happening to national wealth

Genuine saving, a measurement devised by the World Bank, attempts to show whether the stock of national wealth is growing or shrinking. It starts with conventional measures of saving (from the national accounts), adds investment in education and deducts estimates of resource depletion and environmental degradation (Table 5.7). It can help to show whether, for example, the level of government expenditure is sustainable, tax and monetary policies encourage saving, resource royalties are consumed or invested (and if invested, how), and saving is sufficient to offset any cumulative effects of pollution.

ECOLOGICAL FOOTPRINT

The ecological footprint sums the quantities of energy and renewable resources – minerals excluded – that a society (at any level from country to community), household, sector or business consumes by converting

Table 5.7 Genuine domestic savings: accounting for depletion of human, physical and natural capital. An example from Pakistan

Pakistan	Percentage of GDP in 1997
Gross domestic savings	**10.4**
Consumption of fixed capital	6.4
Net domestic saving	**4.0**
Education expenditure	1.9
Energy depletion	1.1
Net forest depletion	1.6
CO_2 damage	0.8
Genuine domestic savings	**2.5**

Source: World Bank (1999)

Ecological footprints indicate consumption pressure

them to a common unit of area: the area of productive land and sea required to supply the same resources and absorb the carbon dioxide from fossil fuels. This area is a society's ecological footprint, a vivid indicator of consumption pressure (Box 5.11).

There are two approaches to calculating ecological footprints. The *'compound' approach*, which is the more comprehensive method, is composed of three parts:

- The first consists of consumption analysis of over 50 biotic resources such as meat, dairy produce, fruit, vegetables, grains, tobacco, coffee and wood products. Consumption is calculated by adding together the amount imported and produced, and subtracting exports. Consumption quantities are divided by FAO estimates of world average yield, to give the area of arable, pasture, forest land or sea necessary to sustain this consumption (Table 5.8). Where necessary, adjustments are made to avoid double counting across categories. For example, grain-fed animals are accounted for by grain consumed (ie as arable land), rather than grazed pasture land.
- The second part determines the energy footprint – usually the amount of forested land necessary to sequester the carbon dioxide emissions – considering both locally generated energy and that embodied in over 100 categories of traded goods.
- The final part summarizes the footprint in different ecological categories to give the overall footprint per capita, which is multiplied by the population to give the total footprint of an area. This is then compared with an estimate of how much biocapacity exists within the area or country to give the external footprint.

Box 5.11 Ecological footprints: some examples

- The land area or ecological footprint required to supply London's environmental needs is 120 times the size of London.
- An area three times the size of the UK's productive forests is more or less permanently taken up in providing wood products for the UK.
- In Colombia, the footprint of a semi-intensive prawn farm is between 35 and 190 times the size of the farm.

Source: IIED (1995)

Table 5.8 Calculating annual consumption of biotic resources: Costa Rica (1995)

Resource	Global yield (kg/ha)	Production (t)	Import (t)	Export (t)	Apparent consumption (t)	Net imported, manufactured products (t)	Footprint component (ha/cap)	Land category
Beef/buffalo	32	92,232	400	21,410	71,222		0.6529	Pasture
Sheep/goat	72	22	3	180	–155		–0.0006	Pasture
Other meat	764	87,746	564	3,270		–2706	–0.0010	Arable
Milk	458	539,000	0	12,968	526,032		0.3355	Pasture
Cheese	46	6,000	250	189		61	0.0004	Pasture
Butter	22	4,000	0	81		–81	–0.0011	Pasture
Eggs	573		0	0		0	0.0000	Arable
Marine fish	35				6		0.1846	Sea
Cereals	2,752	206,000	588,400	7000	787,400		0.0836	Arable
Fruit/vegetables	8,136	3,297,000	12,396	2,461,512	847,884		0.0304	Arable
Animal feed	2,752		0	0		0	0.0000	Arable
Roots/tubers	12,814	209,000	1,600	330	210,270		0.0048	Arable
Pulses	802	28,000	16,000	3,675	40,325		0.0147	Arable

Source: Chambers et al (2000)

In the *'component-based' approach*, footprint values for certain activities, such as car travel, primary energy use, waste production and food consumption, are pre-calculated using data appropriate to the region under consideration. The aim is to account for most consumption with a series of component analyses. For example, to calculate the impact of car travel on fuel consumption, manufacturing and maintenance energy, data on land take and distance travelled are used to derive an average ecological footprint per kilometre travelled. This can then be used to calculate the impact of vehicle use at individual, organizational or regional level. Because this method indicates impacts by activity, it is useful for policy-making and education. However, it is data intensive and the results will vary depending on the source and reliability of data (Chambers et al 2000).

Looking at ecological footprints from a Southern perspective, the late Anil Agarwal of the Centre for Science and Environment in India estimated that the total biomass currently exported from the developing world to industrial countries is ten times greater than during the colonial period (Weizsacker 1994). These exports of carrying capacity do not necessarily pose a problem if they are drawing on true ecological surpluses, and if enough remains for meeting local needs. Currently, there is no guarantee that trade flows are based on these principles.

NATURAL RESOURCE, MATERIALS AND ENERGY ACCOUNTS

Measuring physical exchanges between the economy and the environment

Natural resource accounts and material/energy balances measure physical exchanges between the economy and the environment. Natural resource accounts record changes in the stocks of raw materials such as minerals or timber. Material/energy balances record the flows of materials and energy from the environment to the economy, through the economy, and back to the environment as pollution and wastes.

'Total material requirement' (TMR) has been calculated for the United States, Austria, Germany, The Netherlands and Japan. It includes the natural resources that enter the economy as commodities for further processing, such as grain used in food manufacturing, petroleum sent to a refinery, minerals that go into metal products and logs for lumber. It also includes materials that are displaced in the course of resource production or construction: for example, soil erosion from agriculture, the rock and soil removed to reach an ore body, the portion of ore that is discarded to concentrate it, and material moved to build a highway or dredge a channel. The weight of all these materials is added up to obtain a country's TMR. For example, the TMR of the United States is 22 billion metric tons, and Japan's TMR per person is 45 metric tons (Adriaanse et al 1997; Fischer-Kowalski et al 1997). Another study has calculated the 'total domestic output' (TDO) of these countries: the amount of TMR that is returned to the national environment as pollutants of air, land and water. For example, the TDO of the United States is 19 billion metric tons, and Japan's TDO per person is 14 metric tons (Matthews et al 2000). Calculation of TMR and TDO is highly data-intensive.

HUMAN DEVELOPMENT INDEX

The Human Development Index, developed for the United Nations Development Programme's *Human Development Report*, combines indicators of longevity (life expectancy at birth), education (adult literacy rate and combined gross enrolment rate) and standard of living (real GDP per capita). It is the most widely accepted alternative to GNP and can be used as a stand-alone index of human conditions or together with other socio-economic indicators as part of a sustainability assessment. In the latter case, however, care should be taken to avoid double counting indicators of longevity, education and income that may already be included. Box 5.12 provides further details.

Using socio-economic indicators to measure human conditions as an alternative to GNP

SUSTAINABLE LIVELIHOODS ANALYSIS

The sustainable livelihoods (SL) framework (Figure 5.7) groups particular components of livelihood – the capital assets, vulnerability/opportunity context – and all the institutional structures and processes that may transform livelihoods.

This framework is a useful diagnostic device for assessing the use of capital assets, and the outcomes at the level of individuals', households' or communities' livelihoods in given policy contexts. As Shankland (2000) points out, there has tended to be a wide gap between bottom-up local level analysis and top-down policy analysis. Local level analyses have frequently not been fully aware of how policy is made and how it interacts with and impacts on local groups (it is presented as a remote part of the 'context' rather than something in which people can engage). In contrast, policy analysis has tended to focus on the motivations and initiatives of policy elites and bureaucrats, rather than the perspective of those ultimately affected by policy choices; where it does include local stakeholders, it is in terms of 'impacts on people' rather than their participation in policy.

A diagnostic for assessing capital assets for …

The sustainable livelihoods framework offers a number of elements that can help to bridge the gap between policy and livelihoods:

… helping to bridge the gap between policy and livelihoods …

- as an illustration of how policy is a part of livelihoods and how local people engage in both formal and informal policy;
- by emphasizing the importance of 'social and political capital' within people's lives and how it is within these asset groups that power to influence policy generally lies;
- as a means to 'ground-truth' policy analyses – checking that they are capturing what actually happens on the ground, rather than what is supposed to happen;
- as a means to develop sustainable development indicators at the sustainable livelihoods level (which may help improve understanding at the policy level);
- by providing a structure to merge the findings of policy and livelihoods analyses such that the links can be discerned.

Box 5.12 The Human Development Index

Whereas the well-used measure of national wealth – gross national product (GNP) – is measured by money, the Human Development Index (HDI), introduced by the UNDP Human Development Report (1990) measures national progress through the indexation of three socio-economic indicators:

- *Longevity* – measured by life expectancy at birth.
- *Knowledge* – measured by a combination of adult literacy (two-thirds weight) and combined secondary and tertiary school enrolment ratios (one-third weight).
- *Standard of living* – measured by real GDP per capita (purchasing power parity dollars, PPP$) – after adjusting for purchasing power.

It sets a minimum and maximum for each dimension and then shows where each country stands in relation to these scales – expressed as a value between 0 and 1. The scores for the three dimensions are then averaged in an overall index between 0 and 1.

The HDI offers an alternative to GNP for measuring the relative socio-economic progress at national and sub-national levels. Comparing HDI and per capita income ranks of countries, regions or ethnic groups within countries can highlight the relationship between their material wealth and income on the one hand and their human development on the other. A negative gap implies the potential of redirecting resources to human development.

The HDI facilitates the determination of priorities for policy intervention and the evaluation of progress over time. It also permits instructive comparisons of the experiences within and between different countries. A country's overall index can conceal the variation in living standards within it. Hence, where a country has great internal inequality, the best solution would be to create separate HDIs for the most significant groups, for example, by gender, by income groups, by geographical region or by ethnicity. These 'disaggregated HDIs' are arrived at by using the data for the HDI components pertaining to each of the groups into which the HDI is aggregated, treating each group as if it were a separate country. Disaggregated HDIs at the national and sub-national levels help to highlight the significant disparities and gaps: among regions, between the sexes, between urban and rural areas and among ethnic groups. The analysis made possible by the use of the disaggregated HDIs should help to guide policy and action to address gaps and inequalities.

Nevertheless, it can be difficult to use HDI to monitor changes in human development in the short term because two of its components, namely life expectancy and adult literacy, change slowly. To address this limitation, components that are more sensitive to short-term changes such as the rate of employment, the percentage of the population with access to health services, or the daily caloric intake as a percentage of recommended intake, can be used.

The usefulness and versatility of the HDI as an analytical tool for human development at the national and sub-national levels would be enhanced if countries chose components that reflect their priorities and problems and are sensitive to their development levels, rather than rigidly using the three components presented in the HDI of the global Human Development Reports.

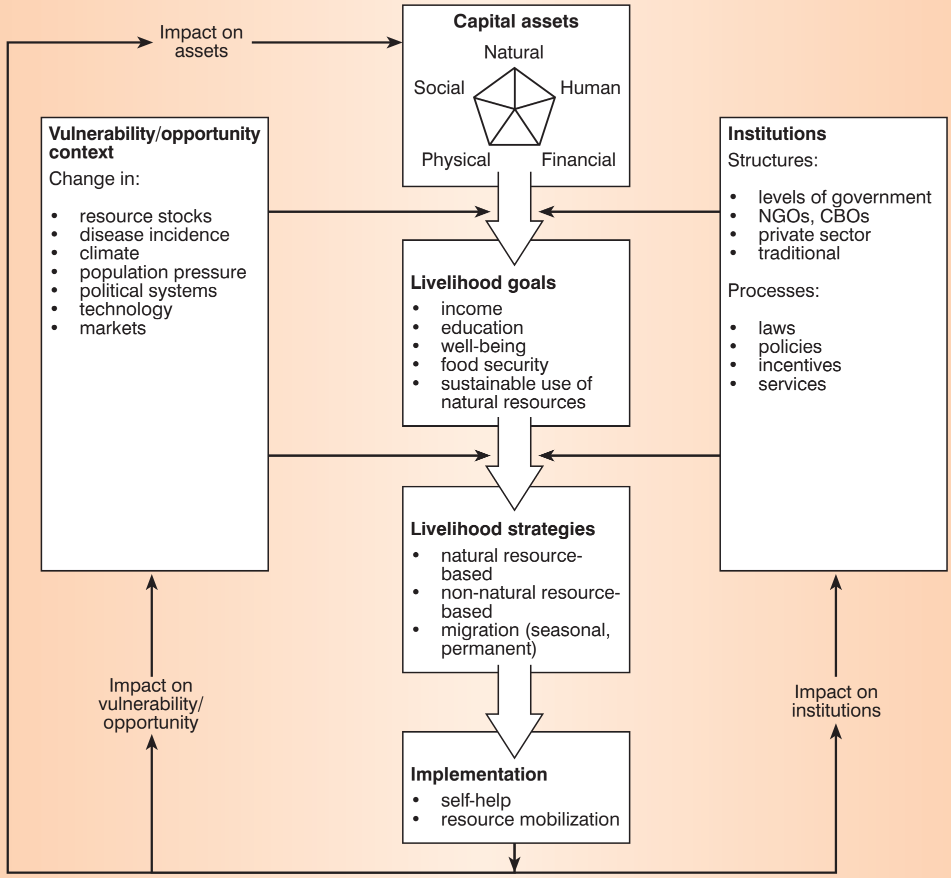
Assuming income to be proportionally related to life expectancies and literacy and inverse-proportionally related to infant and child mortality rates can be misleading. These correlations can break down in many societies, where the maximization of wealth and the enrichment of human lives need not move in the same direction.

Source: UNDP: http://www.undp.org/hdro/anatools.htm

… and to develop key questions

Thus the framework can be employed to develop the following kinds of questions (Shankland 2000). These might be answered through sampling or through community-based issue analysis (page 153):

- *Livelihood priorities:* Who and where are the poor? What are their current livelihood priorities – traditional and emerging areas (see page 124)? What types of policy sector are relevant to those priorities?
- *The policy context for the livelihoods of the poor:* What is current policy in those sectors? Who makes that policy? What is the macro context for that policy?
- *Policy instruments affecting livelihoods:* What measures or instruments have been put in place to implement each policy? What are their characteristics? Through what institutions are these measures implemented and reviewed?



Source: Adapted from Carney 1998 by Dalal-Clayton and Dent (2001)

Figure 5.7 Sustainable livelihoods framework

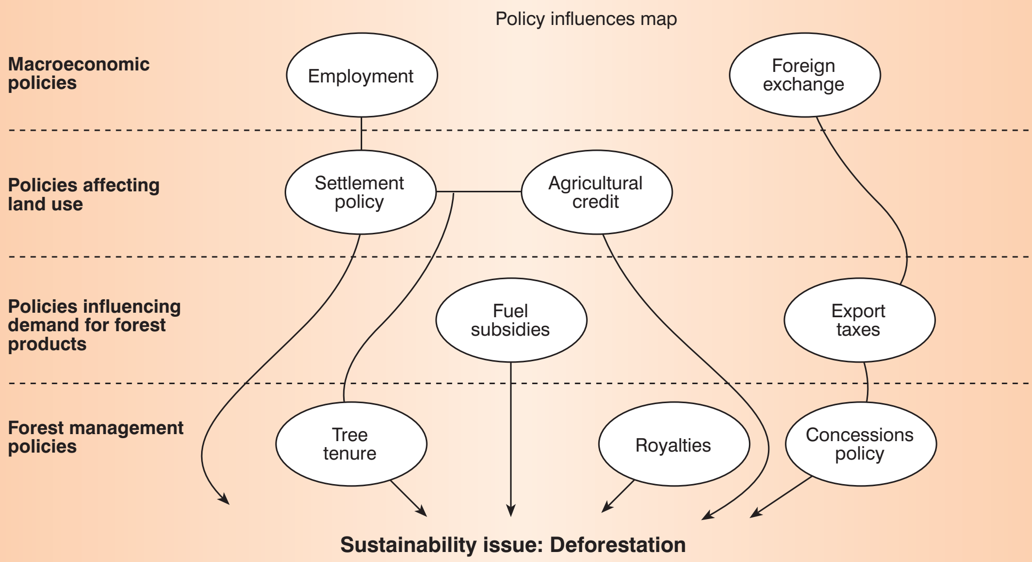
- *Policy in the local context:* In what form do these institutions exist locally? What other institutions (formal or informal, such as labour-sharing arrangements and caste systems) affect local responses to policy? And what other institutions might be affected by policy? How do existing development strategy processes fit with the reality of local livelihoods?
- *People and policy:* What resources can poor people draw on to influence policy? What opportunities exist for poor people to influence policy, directly or indirectly? To what extent does government believe that inequality is a constraint to sustainable development?

These questions will give rise to information on local stakeholders (see page 120) and likely promising policy processes and mechanisms (see page 161) for the strategy to use, as well as providing broad information to enrich and verify the picture of the national context.

POLICY INFLUENCE MAPPING

Policy mapping – visualizing the causes of problems

This visualization method can be used to gradually map out the potential underlying causes of an identified problem, beginning with the more obvious proximate causes. Policies send signals to different actors and encourage certain types of reaction. Some signals are strong and compelling, while others are weak and almost subliminal. In a way, they can be viewed as consecutive layers of influence. Indeed, this is often a



Source: Mayers and Bass (1999)

Figure 5.8 Simple policy influences map concerning deforestation

good way to visualize them – and such visualization can help in discussing policy as a mixed group of stakeholders.

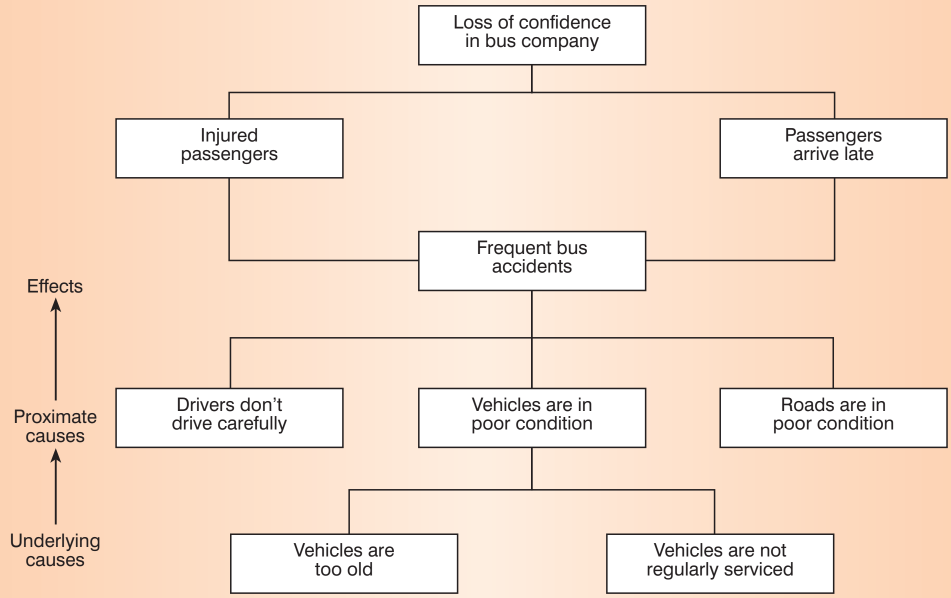
The example in Figure 5.8 reflects a multi-stakeholder discussion about the policy influences on deforestation. Some stakeholders were more immediately concerned about the influence of forest management policies (the inner circle of influence). But others pointed to the increasing power of less proximate policies, such as foreign exchange policies. Not only did these influence forest management policies as such, but they also had an effect on forests and forest stakeholders by increasing the price of cash crop exports and, therefore, deforestation. Thus, chains of influence can be mapped out. More sophisticated versions can show the effect of non-formal policies and of private sector policies.

PROBLEM TREES AND CAUSAL DIAGRAMS

Problem trees allow a multi-stakeholder/disciplinary team to pool their analyses of several problems and map the linkages between them. This is akin to a more complex version of policy mapping, but considers a wider range of variables than policy, and tries to be more exact about tracing specific causes and effects. It can be developed in a participatory way by using the ZOPP ('Objectives-Oriented Project Planning') method.

Arranging causes and effects in a logical sequence

Through ZOPP, problem trees can be developed by multidisciplinary teams. They identify the problems and interests of the people affected by a sustainability issue, write down each problem on a separate card and pin it onto a board in a logical sequence. The first step is to identify a 'core problem', which appears to be of central importance for the affected persons, through group discussion. The causes of this problem are then arranged in logical sequence underneath it, while the effects of the core problem are arranged above it. The problem tree gradually builds up, allowing complex relationships to be clearly portrayed (Figure 5.9.). Recent advances in problem tree software (eg MINDMANAGER, 3.5) have resulted in the routine use of problem trees for displaying complex cause and effect linkages. For example, visual 'Mind Maps' can display the logical progression from the key problem or 'effect' (for example, poverty) to the underlying causes of poverty by asking the question 'Why?'



This figure provides a theoretical example of a problem tree developed using the ZOPP technique to plan a project in response to problems with a public transport system characterized by frequent bus accidents and high injury rates. Once the problems have been logically arranged, the problem tree is used to identify corresponding project objectives.

Source: GTZ (1990)

Figure 5.9 Problem tree

Although problem trees or causal diagrams have often taken a one-off approach, they can also be structured around standard sustainability criteria. The advantage here is that they can then be compared or ranked in different ways. For example, they can be structured around five causes of poverty which equate to low levels of the five capital assets within the sustainable livelihoods approach (Figure 5.10) (Macqueen 1999). Obviously, each of the causes in Figure 5.10 can also itself be treated as a problem, and analysis can proceed even further through more detailed causal diagrams.[4] In addition, it is possible to weight each of the branches, for example to allow prioritization. This may be done through some form of participatory ranking exercise where a score is given to each constraint by a representative sample of key informants.

STRATEGIC ENVIRONMENTAL ASSESSMENT

SEA – environmental assessment at the policy, plan or programme level …

Environmental impact assessment (EIA) has conventionally been applied at a project level. It represents a limited response to the challenges of sustainable development discussed on page 7. It is also increasingly evident that many of the environmental problems associated with development projects arise because insufficient attention is given to environmental issues at higher levels of policy-making. Strategic environmental assessment (SEA) has emerged in the last decade as a response to the need to adopt more proactive, integrated approaches that address the causes of unsustainable development, which lie in government macro-economic policies, investment, trade and development programmes, energy and transport plans, and so on.

Sadler and Verheem (1996) have defined SEA as:

4 Ultimately, branching will cease where the tips represent, for example, fixed states (such as climatic constraints), basic laws (eg of free market economics) or links to other branch tips (leading to loops, eg 'poverty trap spirals').

A systematic process for evaluating the environmental consequences of proposed policy, plan or programme initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision-making on par with economic and social considerations.

Table 5.9 Comparing SEA and EIA

Strategic environmental assessment (SEA)	Environmental impact assessment (EIA)
Is proactive and informs development	Usually reacts to a specific development proposal
Assesses the effects of a proposed policy, programme or plan on the environment; or the effect of the environment on development needs and opportunities	Assesses the effects of a proposed specific development on the environment, and is not well linked to policy decisions
Assesses cumulative impacts and identifies implications for SD	Assesses direct impacts and benefits
Focuses on maintaining a chosen level of environmental quality	Focuses on the mitigation of (negative) impacts
Is a continuing process aimed at providing information at the right time	Has a well-defined beginning and end
Creates a framework against which many (negative) impacts can be measured	Focuses on specific project impacts
Has a broad perspective and low level of detail	Has a narrow perspective and a high level of detail
Driven by need for vision and overall framework for policy (as in an NSDS)	Driven by need for watertight legal process requirements (as in lawsuits)

Source: Adapted from CSIR (1996)

… offers a flexible tool for forward planning

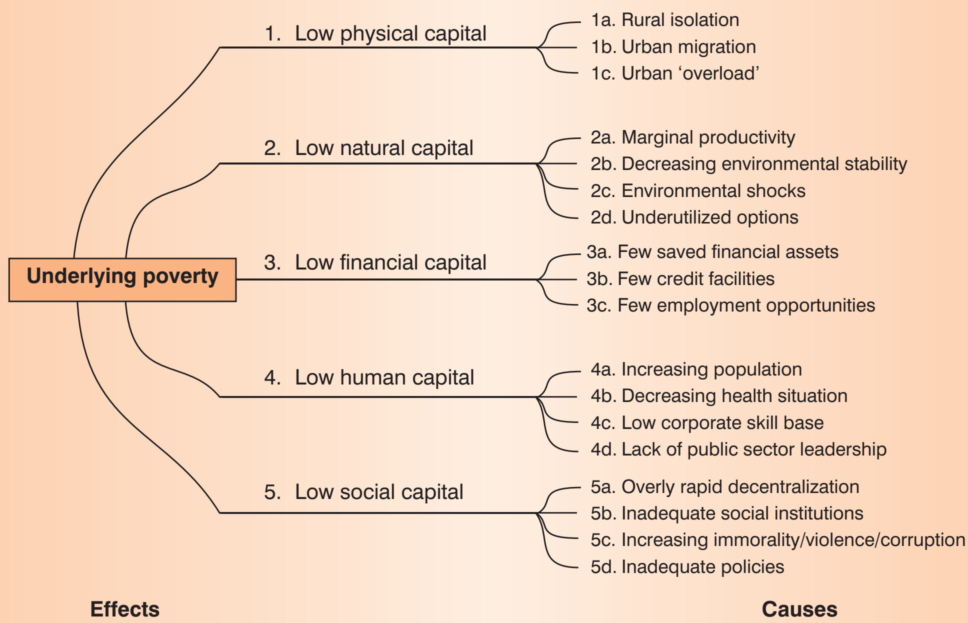
SEA should therefore be seen as a decision-aiding rather than a decision-making process; it is a 'tool for forward planning' to be flexibly applied at various stages of the policy-making cycle (Sadler 1997). Under this broad perspective, SEA encompasses assessments of both broad policy initiatives and more concrete programmes and plans that have physical and spatial references. With this scope of coverage, the methodologies to be applied at the opposite ends of the decision-making spectrum differ markedly, but the principles of EIA should apply at all levels. Because SEA is driven by the need for a clear vision for environmental mainstreaming and an overall framework for policy development (as in a strategy for sustainable development), it is more suitable than EIA for preparing analytical material for such strategies (see Table 5.9).

To date, formal provision and guidelines for undertaking SEA are confined largely to industrial countries (eg Australia, Canada, The Netherlands, New Zealand, UK, USA). Experience with SEA appears to be very limited in developing countries (except for the requirements of lending and donor agencies, particularly the World Bank) although there is increasing experimentation with the approach.

There is no standard method, but three broad approaches

There is no standard or universal methodology for SEA. Processes vary considerably,[5] but some basic principles for the steps in SEA can be identified (Box 5.13). SEA processes may be either formal or informal, comprehensive or focused, and closely linked with or unrelated to either policy or planning instruments. In general, three broad approaches to SEA have been adopted to date:

5 Useful reviews of SEA approaches and case studies can be found in Sadler and Verheem (1996); de Boer and Sadler (1996); Therivel and Partidario (1996) and the World Bank (1996).



Source: Macqueen (1999)

Figure 5.10 Causal diagram of cause and effect linkages relating to poverty. (An example from a forestry-focused poverty survey in the Southern African Development Community region.)

1. It has been introduced as a relatively separate, distinct process – typically as an extension of EIA.
2. It has been established as a two tier system (eg in The Netherlands) with formal SEAs required for specific sectoral plans and programmes and an environmental 'test' applied to strategic policies.
3. It has been incorporated into environmental policy appraisal (eg in the UK) and regional and land use planning (eg in Sweden). Recently, there has been growing recognition of the importance of integrating EA with other policy and planning instruments.

A particularly promising form of SEA (in the context of strategies for sustainable development) is Strategic Environmental Analysis (denoted by the acronym SEAn). This experimental methodology has been developed and tested by the Dutch group AIDEnvironment, in cooperation with SNV (Netherlands Development Organization). It is designed for use at the earliest possible stage of policy-making to allow the relevant environmental issues and options to be fully integrated into policy, plan and programme design and priority setting. The methodology is based on experiences with EIA, environmental profiles and environmental planning, monitoring and evaluation within the project cycle, and comprises ten steps (Box 5.14) 'which are executed in a participatory manner, with systematic attention for the views and opinions of 'insiders' (local actors)' (Kessler 1997b).

Testing a 10-step planning tool for sustainable development

Initially, the primary aim for SNV was to apply the methodology for formulating (new or adjusted) country policy plans. It has been applied under various conditions in Zimbabwe (to prepare district development plans), in Ghana (for SNV regional planning), in Benin and Nicaragua (for strategic planning purposes of donor agencies, local government or NGOs) and in Benin, Bolivia, Honduras and Zambia. Most have been carried out in collaboration with The Netherlands Development Organization SNV. Lessons from the experiences in Benin and Nicaragua are documented in Box 5.15.

Box 5.13 Some principles for strategic environmental assessment

An SEA process should ensure:

- *Screening:* responsible agencies carry out an appropriate assessment of all strategic decisions with significant environmental consequences.
- *Timing:* results of the assessment are available sufficiently early for use in the preparation of the strategic decision.
- *Environmental scoping:* all relevant information is provided to judge whether: (i) an initiative should proceed, and (ii) objectives could be achieved in a more environmentally friendly way (ie through alternative initiatives or approaches).
- *Other factors:* sufficient information is available on other factors, including socio-economic conditions, either parallel to or integrated in the assessment.
- *Review:* the quality of the process and information is safeguarded by effective review mechanisms.
- *Participation:* sufficient information of all legitimate stakeholders (including the public affected) is available early enough to be used effectively in the preparation of the strategic decision.
- *Documentation:* results are identifiable, understandable and available to all parties affected by the decision.
- *Decision-making and accountability:* it is clear to all stakeholders and all parties affected how the results were taken into account in decision-making.
- *Post-decision:* sufficient information on the actual impacts of implementing the decision is gained to judge whether the decision should be amended.

Source: Dalal-Clayton and Sadler (1998a,b) – adapted from Sadler (1998) and Tonk and Verheem (1998)

Box 5.14 Strategic Environmental Analysis (SEAn): the AIDEnvironment approach. The main steps

The strategic environmental analysis approach aims to be systematic, analytical and practical. Ten methodological steps create a logical structure and provide guidance to participants in clarifying the complex issues involved.

Steps 1–4: Society–environment context analysis and impact assessment:

- identification of the main environmental functions (production and regulation);
- defining stakeholders dependent upon these functions;
- assessment of current trends within the functions revealed by environmental indicators;
- assessment of consequences (impacts) of trends on stakeholders, future generations and natural values, using environmental impact chains and a trend-impact matrix;
- defining the norms, standards and thresholds involved.

Steps 5–6: Environmental problem analysis:

- definition of the main environmental problems, based on the impacts of trends and a risk analysis;
- identification of the key factors and related actors causing the problem using the action-in-context approach (underlying factors will be mainly socio-cultural, economic and/or institutional).

Steps 7–8: Environmental opportunity analysis:

- definition of the main environmental opportunities;
- identification of the main underlying factors and the actors to realize and benefit from these opportunities.

Steps 9–10: Formulation of a sustainable development policy plan with action fields and follow-up strategy:

- synthesis of the key factors and actors related to the environmental problems and opportunities;
- definition of environmental action fields;
- definition of sustainable development action fields by integrating priority issues from social and economic dimensions;
- formulation of a policy and coherent action plan for sustainable development based on the strengths and weaknesses of the relevant institutions and existing development policies;
- formulation of a follow-up strategy, including definition of coordination responsibilities, establishment of a monitoring system with relevant indicators, procedures for regular adjustments to policy using relevant strategic environmental analysis steps, institutional strengthening and capacity building.

Source: AIDEnvironment (1997); Kessler (1997a,b)

Box 5.15 Lessons from strategic environmental analysis (SEAn) in Benin and Nicaragua

A number of lessons can be drawn from two widely different cases of applying the SEAn methodology.

1. The resulting strategic plan is not an environmental plan, but an integrated (sustainable development) plan. The SEAn methodology takes the environmental domain (goods and services provided to human society) as a starting point to find solutions and opportunities in the areas of overlap with the socio-economic and institutional domains.
2. The process of executing the ten methodological steps is at least as important as the actual outcome in terms of a strategic plan (Benin) or thematic reports (Nicaragua). The participatory approach allows participants to exchange ideas and views on key problems underlying root causes of unsustainability and key opportunities for sustainable development.
3. Even if (as in Benin) little time is available and there is a risk of ending up with broad and general outcomes, the process facilitates the surfacing of common views among different actors involved. Participants were particularly satisfied about the methodology as a logical framework to structure discussions. For many participants it was the first time to collaborate actively with other disciplines, and for government officers to exchange views and information with NGOs.
4. One of the main differences between the strategic plan resulting from an SEAn and existing environmental action plans is the emphasis on priority themes agreed upon by participants at the meso-level (eg to support districts and local councils in making their own development plans as part of a decentralization and capacity-building process), as well as a certain level of commitment to work on agreed activities. The meso-level is the highest level at which local stakeholders can deal with concrete issues and at which they organize themselves, while it is the lowest level at which government departments are well informed and can negotiate with other stakeholders.
5. Since SEAn step 9 takes into consideration existing policies and ongoing programmes, the resulting plan is not an unrealistic ideal plan but a gradual step in the right direction.
6. The main challenge is to simplify the existing SEAn methodology and to integrate tools from other disciplines to develop an integrated sustainability analysis. It is also clear that the entire planning process requires more continuous facilitation support than has been available so far (ie over a longer period of time, not more intensive), to implement, monitor and evaluate the activities that have been agreed upon.

Source: Dalal-Clayton and Sadler (1998b)

COMMUNITY-BASED ISSUE ANALYSIS[6]

The analysis of issues by communities is fundamental to a truly participatory planning effort. Unlike traditional ‘consultation’ and ‘auditing’, which are often top-down, expert-driven information-gathering activities, community-based issue analysis uses a series of exercises to help stakeholders share knowledge, review and participate in technical assessments, set planning priorities and jointly develop options for action. In short, the functions of community-based analysis:

- initiate detailed dialogue among community groups and between the community and technical experts;
- focus planning on people’s recognized interests, needs and preferences;
- inform stakeholders about the technical aspects of the problems that they wish to resolve, by engaging them in the collection and analysis of data;
- prevent uncritical and sole reliance on the assessments of (often external) experts;
- create a well-informed constituency of residents to work for empowerment and sustainability.

13 steps to community-based analysis

Community-based issue analysis follows a process of 13 steps:

6 Main source for this section: ICLEI et al (1996a)

1 Decide what level of participation will be facilitated in the issue analysis process – stakeholder representation or direct participation.
2 Determine what target communities and target groups will be recruited to participate in the process.
3 Inform the target communities and groups about the issue analysis process.
4 With the target communities/groups, decide what specific issues will be analysed.
5 Select methods and tools for the participant assessment of the chosen issues.
6 Select methods and tools for the technical assessment of the chosen issues.
7 Modify the selected technical assessment methods to permit stakeholder involvement in the technical assessment exercise.
8 Review assessment methods to ensure that they support the analysis of systemic problems.
9 Establish baseline data on key conditions.
10 Present the findings of technical assessments to the issue analysis participants before the conclusion of the participant assessment exercises.
11 Identify any issues that require further assessment.
12 Identify any proposals or options for action that should be considered in the action planning process.
13 Prepare the final issue analysis report.

Combining participatory and expert technical assessments

A comprehensive community-based issue analysis process uses both participant assessment and technical assessment methods in parallel to achieve a consensus analysis of key issues and the tools used will depend on the capacities of the community.

- *Participant assessment* exercises are used to involve local inhabitants and service users at a very basic level. Inhabitants are assisted in defining problems and identifying what services they want most and how the services can be provided sustainably. Special exercises are used to identify indigenous solutions and to apply local know-how to the analysis of problems and the development of solutions. Participant assessment methods that have been used around the world include: mapping, focus groups, SWOT analysis, logical framework and search conferences (see Box 6.28).
- *Technical assessment* methods are designed and employed to inform the participant assessment process. Technical assessment methods – such as comparative risk assessment, environmental impact assessment and systems analysis – can be modified to allow for extensive stakeholder participation.

The key to a successful community-based assessment process is to link together the use of participant assessment exercises and expert technical assessments. Specifically, an assessment process should be organized in such a way that stakeholders participate in the technical assessments; and the findings of the technical assessments are provided as final inputs into the participant assessment process.

Deciding what to measure: a framework of parts and aims

'Indicator-based assessments' on page 135 discussed the pros and cons of indicator-based assessment. The main steps in developing such a form of assessment are:

- designing a framework of parts and aims (described here);
- choosing indicators (page 158);
- generating indices (page 159);
- identifying priority issues and policy options (page 160).

A framework of parts (components, dimensions, elements, themes, etc) is an arrangement of the parts of a system that must be measured to get a clear and accurate reading of the state of that system and changes to it. A framework of aims (goals, objectives, principles, criteria, etc) is an arrangement of the aim of each part, succinctly expressing its point, the main item or items of concern, and the level or type of performance that is sought. A combined framework of parts and aims provides a checklist of the human and environmental conditions required for sustainable development. More importantly, it enables people to:

- identify the essential parts of the system;
- avoid measuring the same part more than once;
- avoid omitting an essential part;
- highlight unavoidable gaps (so that everyone knows that a part is missing if there is no suitable indicator for it);
- ensure that an appropriate weight or value is given to each part;
- show the logic underlying the selection of parts and the weight given to each;
- measure key relationships between groups of parts;
- combine the indicators to provide measurements not just of the particular parts they represent but also of major groups of parts and of the system as a whole;
- Part of a framework of parts and aims is shown in Table 5.10.

A well-designed indicator framework (able to fulfil all the above functions) is systemic, hierarchical, logical and communicable. *Systemic* means that the parts are organized to facilitate analysis of key properties of the system and relationships between subsystems and major features. In Figure 5.11, for example, the division of the system into two subsystems (people and ecosystem) reflects the fact that human societies exist within ecosystems. It also facilitates analysis of the relationship between human and environmental conditions. The division of the human subsystem into major groups of human concerns and of the ecosystem into major compartments facilitates analysis of (for example) the relationship between resource use and the state of the rest of the ecosystem (land, water, air, biodiversity), resource use and wealth, and wealth and the state of the rest of the human subsystem.

The indicator framework should be systemic, hierarchical, logical and communicable

Hierarchical means that the parts are organized into a series of levels. Lower levels are narrower in scope and more specific than higher levels. Components on the same level are roughly equal in scope and overlap as little as possible. For example, land diversity and land quality (Figure 5.12) are intended to be equally important parts of land; conversion, modification and protection to be equally important aspects of land diversity; and forest quality and soil quality to cover roughly equal aspects of land quality.

Logical means that the levels form a series of means and ends. The level below is a means of achieving the level above. The level above is the end or purpose of the level below. For example:

- What we must measure (*means*): We measure *ecosystem well-being,* by measuring the condition of the *land,* which we do by measuring *land diversity,* which we do by measuring *conversion,* which we do by measuring *the percentage of each ecosystem type converted to non-forest or plantation.*
- Why we measure it (*ends*): We measure *the percentage of each ecosystem type converted to non-forest or plantation* to measure *conversion,* which we do to measure *land diversity,* which we do to measure the condition of the *land,* which we do to measure *ecosystem well-being.*

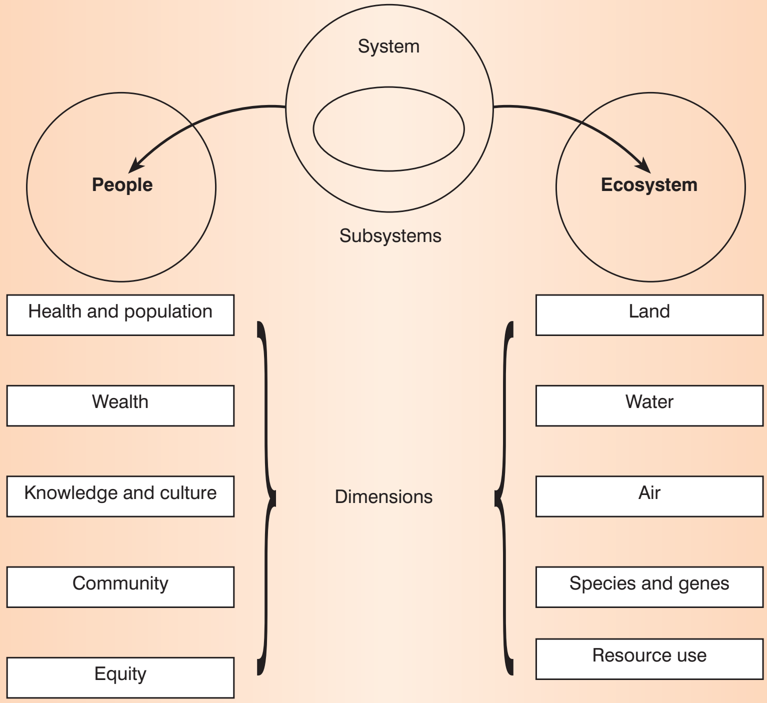
Table 5.10 Illustrative framework of parts and aims for indicator-based assessment (human subsystem only)

Parts (increasing specificity) ➡			Aims
Element group	**Element**	**Sub-element**	**Objective**
Health and population	Health		People enjoy long lives in good health
	Population		Populations are stable, with a balance of age groups, and within the bounds of human and natural resources
Wealth	Individual and corporate wealth	Needs	Individuals and households meet their needs
		Income	and obtain the income to secure their material well-being
		Business	Businesses are profitable and competitive
	Societal wealth	Capital and productivity	The society has the resources to promote enterprise and maintain prosperity,
		Inflation and employment	providing a stable climate for investment and decent livelihoods,
		Debt	while living within its means
Knowledge and culture	Knowledge	State of knowledge	People have the knowledge to innovate and cope with change, live well and sustainably, and fulfil their potential
		Education	Education levels are high and the society has well-developed and widely shared systems for transmitting knowledge formally through education
		Communication	and informally through communication
	Culture	Belief	Belief systems meet spiritual needs and promote human and ecosystem well-being
		Spirit and nature	Links between spirit and nature are strengthened and maintained
		Expression	Creative expression flourishes
Community	Freedom and governance	Freedom	The rights of all members of society are fully respected, and individuals are free to choose how decisions are made and who should make them
		Governance	Decision-making bodies are open, clean and effective
	Peace, order and solidarity	Law	Communities and citizens respect the rule of law,
		Crime	protect their members from crime and violence,
		Peace	coexist peacefully
		Solidarity	and provide a helping hand to those who need it
Equity	Gender equality		Benefits and burdens are shared equally between males and females
	Societal equity		and equitably among societal groups

Source: Robert Prescott-Allen, (personal communication)

Communicable means the parts and aims are simply expressed and readily understood by decision-makers and are not abstract or highly technical.

The Rio Declaration, Agenda 21 and some of the international convention texts have been used as frameworks with limited success because they were not designed for this purpose (see, for example, Box 5.16). The United Nations Commission on Sustainable Development started with Agenda 21 as its



Source: Prescott-Allen (2001a)

Figure 5.11 Example of a systemic arrangement of parts

framework but has since switched to a more structured and manageable arrangement of dimensions, themes and sub-themes, cross-referenced to the appropriate sections of Agenda 21 (UN DESA 2001b)

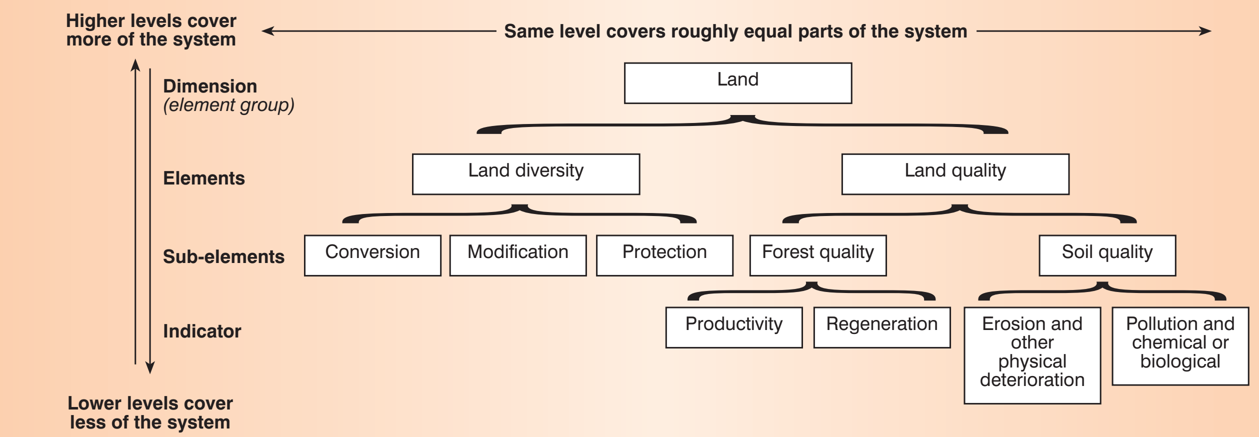
Sector-based indicator frameworks show promise, but have flaws

Sets of principles and criteria that are expressly intended as indicator frameworks have been somewhat more useful. These tend to be devoted to particular sectors, notably forest management, such as the Forest Stewardship Council's principles and criteria (FSC 2000); the Montreal Process's criteria for the conservation and sustainable management of temperate and boreal forests (The Montréal Process 1999); the Pan-European criteria for sustainable forest management (Ministerial Conference on the Protection of Forests in Europe and Pan European Forest Certification Council 1998); and the International Tropical Timber Organization's criteria for sustainable management of natural tropical forests (ITTO 1998).

However, none of these frameworks is fully systemic, hierarchical or logical. Consequently, indicator sets derived from them suffer from one or more of such flaws as an inability to produce clear pictures of socio-economic conditions and the state of the environment, omission of essential aspects of sustainability, overlapping components and consequent redundancy and double-counting, confusion about what is being measured and why, unmeasurable indicators, and distortion of assessments through an emphasis on documenting procedures rather than achieving results.

Indicator-based assessment methods are often the most useful

The most useful frameworks are offered by indicator-based assessment methods because they are cross-sectoral and designed for the measurement of sustainability (page 153). They include Well-being Assessment (Prescott-Allen 2001a) (Figures 5.4 and 5.5), the Dashboard of Sustainability (Figure 5.6), the CSD's indicators of sustainable development (UN DESA 2001b), and the Sustainability Reporting Guidelines for businesses and other organizations (Global Reporting Initiative 2000).



Source: Robert Prescott-Allen (personal communication)

Figure 5.12 Sustainability components arranged hierarchically

These frameworks can help in structuring analyses and developing checklists of questions, but their most important function is to facilitate the selection of a cost-effective set of high quality indicators for sustainability assessment.

Box 5.16 Agenda 21 as a basis for analysis

Agenda 21 was not designed as a framework for measurement and analysis. Consequently, efforts to use it for this purpose have met with variable success.

Costa Rica carried out a comparative analysis of its national development plan with Agenda 21 as a prelude to a comprehensive sustainable development programme. Swaziland conducted a careful, participatory review of Agenda 21 to decide how to integrate principles of sustainability into a revised national development plan. Both Ecuador and El Salvador conducted similar analyses – but also made efforts to separate the process of analysis from any political agenda, so that important principles identified by the process could be adopted by the winner of a subsequent election.

Given the absence of numerical data, Agenda 21 analyses have been subjective, usually involving people coming together to identify what is currently impeding the long-term progress of the country. In Kenya, the problem was seen to lie in a centralized planning system that did not cater to the development needs of communities. In El Salvador, the problem lay in the continuing lack of trust among factions that had fought a civil war. In Morocco, the underlying concern was population growth and employment. In Niger, the principle problem was desertification and land degradation.

Source: UNDP (2000)

Deciding how to measure: choosing indicators

Select representative, reliable and feasible indicators

Because indicators cost money to measure, the ideal is to choose one high quality indicator for each element, sub-element or indicator group (depending on how far down the hierarchy one must go to identify a measurable component). A high quality indicator is representative, reliable and feasible, and indicator selection is often a matter of balancing these qualities (Box 5.17).

A practical procedure is to:

1 Define a representative and reliable indicator for each component (element, sub-element or indicator group). More than one indicator may be necessary if one is insufficiently representative.

2 Review data sources to determine the availability of data for each indicator.
3 If data are not available for an indicator, identify one or more alternative indicators for which data are available (as determined by the data review).
4 If data are not available for the alternatives and a component lacks an indicator, decide whether to develop a programme to obtain the data or to exclude the component from the assessment.
5 If no suitable indicator is available and funds are lacking to provide one, exclude the component concerned from the assessment – but clearly note its exclusion.

Seeing the big sustainability picture: generating indices

Combining indicators can distort their qualities

As noted on page 132 assessments that combine their indicators into indices can communicate their main findings instantly, providing a clear picture of the entire system, revealing key relationships between subsystems and between major components, and facilitating analysis of critical strengths and weaknesses.

The problem with indices is that a typical set of indicators is a mess of incompatible measurements: pollution in milligrams per litre, ecosystem conversion in hectares, species diversity in species numbers, genetic distance and population change, and so on. Combining such different indicators mixes apples and oranges. To do this successfully requires converting the measurements to a common unit that does not

Box 5.17 Selecting indicators

An indicator is fully representative if it:

- covers the most important parts of the component concerned;
- shows trends over time and differences between places and groups of people.

For example, the indicator *percentage of each ecosystem type converted to non-forest or plantation* fully represents the sub-element *conversion,* whereas the indicators *percentage of each ecosystem type converted to agriculture, or percentage of each ecosystem type converted to built land, or percentage of each ecosystem type converted to plantation* do not because they represent only one type of conversion*. The indicator percentage of* ***forest*** *converted is less representative than percentage of each* ***ecosystem type*** *converted* because it is less likely to show differences between one place and another.

An indicator is likely to be **reliable** if it:

- is accurate;
- is measured in a standardized way with sound and consistent sampling procedures;
- is well founded;
- directly reflects the objective of the element or sub-element concerned.

'Well founded' means that the indicator's relationship to the component it represents is well established, scientifically valid or is a defensible and testable hypothesis. For example, the indicator *percentage of each ecosystem type in a natural or old growth state* derives from the view that a number of species and biotic associations are more likely to persist if an adequate part of the ecosystem remains in a natural state – a view that some would regard as scientifically established and others as at least a defensible hypothesis.

An indicator directly reflects the objective of the element or sub-element concerned if it measures its actual achievement rather than factors that could advance or impede its achievement. For example, the indicator *eroded area as a percentage of converted and modified area* measures the actual achievement of part of the objective, 'Soil degradation on modified or cultivated land is close to degradation rates on natural land.' The indicator *area of erosion prone land that is logged* measures a factor that could impede achievement of the objective, and the indicator *area and percentage of forest land systematically assessed for soil erosion hazard* measures a factor that could advance it; but neither measures its direct achievement, and the area and severity of erosion could change regardless of either factor.

An indicator is feasible if it depends on data that are readily available (as maps, statistics or both) or obtainable at reasonable cost. 'Reasonable cost' varies with the indicator. A highly representative and reliable indicator is likely to be cost-effective even if it is expensive. Unrepresentative or unreliable indicators are worthless, no matter how cheap.

distort their qualities as apples or oranges. The common unit may be a physical unit (such as area or toxicity), money or a performance score. Since many indicators are severely distorted when converted to a physical unit or money, Well-being Assessment and the Dashboard of Sustainability (in common with narrower indices such as the Human Development Index and Ecological Sustainability Index) use performance scores.

Instead, performance scores can be used

Indicator measurements are converted to a performance score, much as one currency is converted to another, by defining the rate of exchange between the indicator data and a performance scale. In the Dashboard of Sustainability one end of the scale is set by the best performance (of the societies being assessed) and the other end by the worst performance. For example, in the indicator *life expectancy at birth*, Japan's 81 years is best and defines the top of the scale; Sierra Leone's 34 years is worst and defines the bottom of the scale. So a society with a life expectancy of 57.5 years (half way between best and worst) would get a medium score (50 on a scale of 100 to 0).

In Well-being Assessment's Barometer of Sustainability five bands of 20 points each are defined (good, fair, medium, poor, bad). Performance criteria are chosen for the top point of each band and the base (0) of the scale, on the basis of the range of actual performance, the objective of the element or sub-element that the indicator represents, and factors such as estimated sustainable rates, background rates, observed thresholds, standards or targets (international, national, sub-national), expert opinion, the performance criteria of related indicators and the judgement of participants. Illustrative performance criteria for *life expectancy at birth* and the basis on which they were chosen are given in Table 5.11. Defining bands rather than just the ends of the scale allows the scale to be non-linear: a society with a life expectancy of 57.5 years would get a poor score of 37.

Once the indicators have been given scores, they can be combined back up the hierarchy from indicator to subsystem using standard combining procedures: unweighted average, weighted average or lower/lowest score, whichever is judged to be most appropriate.

Table 5.11 Illustrative performance criteria for the indicator, life expectancy at birth

Element: Health			**Objective: People enjoy long lives in good health**
Band	**Top point on scale**	**Years of life expectancy at birth**	**Basis**
Good	100	85	Encompasses projected high of 84 years by 2050
Fair	80	75	Matches UN target of >75 years by 2015
Medium	60	70	Matches UN target of >70 years by 2005
Poor	40	60	Matches UN target of at least 60 years by 2000
Bad	20	45	
Base	0	30	Encompasses current low of 34 years

Identifying priority sustainability issues: using a rigorous, routine system

A comprehensive indicator-based assessment of sustainability that generates indices – if produced rigorously and systematically – will clearly reveal the priority issues for an NSDS. What is more, it will do so in the context of a well-rounded picture of sustainable development, covering all essential elements, and a measurement of overall performance (eg the Policy Performance Index of the Dashboard of Sustainability; or the Well-being Index, Human Well-being Index, and Ecosystem Well-being Index of the Barometer of Sustainability). For example:

- The Barometer of Sustainability (Figures 5.4 and 5.5) shows that Canada needs to pay most attention to air, resource use, and species and genes. Further interrogation of these dimensions would show that the priority issues are carbon emissions, energy consumption, habitat protection for wild species and agricultural diversity.

- The Dashboard of Sustainability (Figure 5.6) shows a slightly different set of priorities – protected areas, cropland, carbon emissions, renewable energy, nuclear waste and recycling – but nonetheless it shows them clearly.

The next stage is to explore relationships between these issues and other ecological and socio-economic factors and to analyse the motivations, values, behaviours, policies and institutional factors that are behind the issues and need to be addressed to make progress. Policy options can then be developed on the basis of this analysis and associated scenarios. Stakeholder analysis, covering motivations and values, is discussed on page 120, analysis of policy and institutional processes on page 162, scenario development on page 171 and decision-making on policy options in Chapter 8.

Analysing sustainable development mechanisms and processes

We have stated that a strategy is as much a set of continuing *mechanisms or processes* – that provide the facility to debate, plan, experiment, monitor and review sustainable development – as it is an agreed *vision or set of goals*. The kinds of mechanisms that lead to sustainable development are illustrated in Figure 5.13 and are expanded in Table 5.12. The challenge, then, is to develop an inventory of the 'mechanisms and processes that work' and their links, and to improve these links in the context of an NSDS. Such mechanisms may include both long-standing and recent introductions, both formal and informal mechanisms, and both routine and one-off approaches.

Develop an inventory of mechanisms and processes that work …

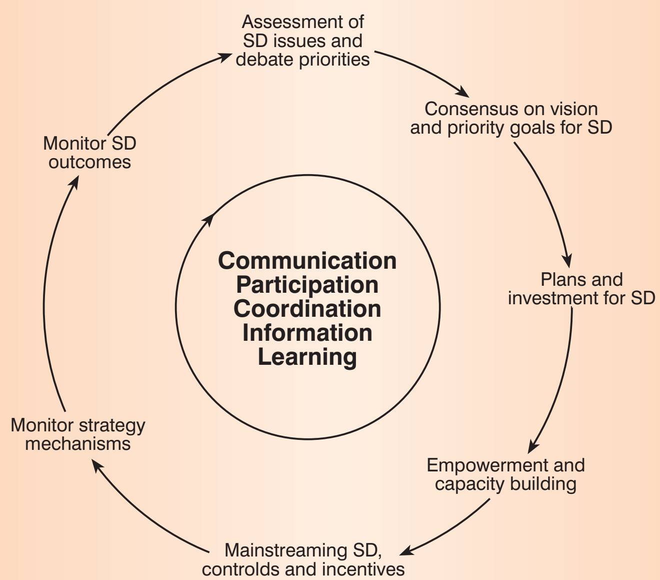


Figure 5.13 Mechanisms for sustainable development: an analytical framework

Steps in analysing the component mechanisms

… and then assess them

As Table 5.12 implies, component mechanisms need first to be listed, and then assessed:

1 *List the mechanisms that currently contribute to the NSDS, or list candidate mechanisms if an NSDS is not yet in place.* Assessors must be open to the variety of sources of such mechanisms. For example, while an existing NSDS might have a formal communications programme, changes in awareness about sustainable development might actually result from other mechanisms that are not connected to the strategy.
2 *Describe each mechanism in terms of:* its legal setting/mandate; the principles followed; responsibilities for the mechanism; the main 'users' of the mechanism; resources actually applied to it in practice; and any contentions or major dilemmas associated with it.
3 *Assess the quality of component mechanisms:* Table 5.13 presents the questions that were asked by the OECD DAC review of NSDSs. A variety of methods will be found useful in answering these questions. Many are listed in Table 5.12. Desk review and key informant interviews will usually prove suitable. A participation intensity map (Figure 5.14) can be drawn up by key informants to express the quality of participation in each of the strategy mechanisms listed in Table 5.12. A SWOT analysis (Box 5.18) can help to reveal which strategies/mechanisms are effective.
4 *Assess the legal framework for sustainable development* in which key mechanisms operate: the substance of the law, the application of the law and constraints (see page 162).
5 *Assess the economic context and conditions* which will determine how any mechanism affects the motivations and behaviour of producers and consumers, and thus to a large extent, its ultimate effectiveness (see page 169).
6 *Assess how all the mechanisms fit together:* their gaps, overlaps and coordination, especially if the task is to bring together promising mechanisms into an NSDS (see page 170).

The secretariat may undertake some of these tasks itself; but it will more likely need to commission and coordinate others to carry out the assessments.

Analysing the legal framework for sustainable development[7]

In recent years, growing attention has centred on the role of law and legal institutions in sustainable development. This has coincided with a profound shift in thinking about the role of the state, and a reorientation of governance strategies towards the creation of suitable enabling environments for greater private and local initiative in sustainable development. Good laws and functioning legal institutions are essential contributors to the predictability, security and flexibility needed to define such environments. Conversely, poorly designed and implemented laws can constrain and inhibit effective action, distort economic incentives and discourage appropriate interventions by government and civil society stakeholders.

A close analysis of the applicable legal framework, therefore, is an important part of assessing the viability of any sustainable development strategy or its components. The scope of such an analysis will vary, of course, depending on the context. The following analytical steps are likely to be applicable in a wide range of situations.

7 This section is based on material prepared by Jon Lindsay, derived from FAO Development Law Service (2000).

Table 5.12 Component mechanisms in NSDSs and how to analyse them

1 Communications and awareness of sustainable development issues	**Market research/polls** with the public, to assess changing awareness of sustainable development issues, and where that awareness came from (NSDS, education, media, etc) **Review media and educational curricula** for changing level of sustainable development contents and the changing kinds of narratives on sustainable development **Key informant interviews** on: direct influence of NSDS documents/activities; level of understanding of current sustainable development goals and provisions
2 Participation in sustainable development debate and action	**Analyse committees and records of decisions** to assess who is contributing to debate and decisions locally and at macro level; assess representation (identity, accountability to group); assess the links between committees – especially between central and decentralized levels, regularity and degree of consensus/conflict Map '**policy communities**' around different sustainable development issues – how are they formed (eg informal, or through involvement in a formal initiative, by local interests or influenced by external agencies); how are they linked (eg poverty alleviation and biodiversity conservation 'policy communities') – do they work together, or clash? Sample **key informant interviews** on changes in representation, transparency, accountability, political commitment. Ask 'whose strategy is it?' to ascertain 'ownership' **Participation intensity mapping** (Figure 5.14) on informant's perception of level of participation in each component 1–12 here
3 Assessment/analysis of sustainable development issues	**Desk and key informant interviews of recent analyses:** Who identified the authors, the questions asked, and the methods used? What were these, and how locally relevant? What is the extent of new (and recycled) information? Are assumptions being tested? Is there a component of consultation in the analysis or is it all expert-led?
4 Consensus, conflict management and negotiation on sustainability	**Desk and key informant interviews** to assess provisions made for reaching agreement and handling disagreements. Are structures and processes emerging with which stakeholders are happy? Or are issues being forced through? What opportunities and constraints are there to improving cross-sectoral and top–bottom linkages?
5 Prioritizing goals for sustainable development	**Identify criteria, systems and procedures** that are being used to choose between options; the extent to which they are informed by social, environmental and economic dimensions and their integration, and whether priorities are clearly presented **Analyse shifts in actual decisions** by key bodies (government, private sector) and attempt to correlate them with the above and with other mechanisms 1–12
6 Financial mobilization, allocation and investment in sustainable development	**Desk analysis of government policies, plans, allocations and disbursement**; categorizing changes in these in relation to agreed sustainable development goals (or to generic sustainable development criteria if no formal SD goals yet established) **Interview** business sector people on investment in sustainable development and which of mechanisms 1–12 this might be correlated with (or whether entirely spontaneous or correlated with international and market demands)

7 Mainstreaming sustainable development concerns by sector activities	**Desk review and key informant interviews** with key sectors on recent policies and programmes for sustainable development; coherence between them; and how this has changed over time
8 Coordinating sustainable development activities	**Key informant interviews** on what sustainable development steering mechanisms have been established, their gaps, duplication and coherence of current sustainable development activities; and on the quality of NSDS process management – its coherence, pacing, adaptability, and so on
9 Capacity building in sustainable development	**Interviews** on changes in attitudes and skills that promote sustainable development and the sources for this; correlation with training/technology development, and with other mechanisms 1–12
10 Empowerment for sustainable development	**Desk review** of provisions for devolution of rights and powers to take responsibility for sustainable development locally **Interview stakeholders** on the practice of the above – particularly regarding opportunities and constraints they face for sustainable development responsibility
11 Information systems on sustainable development	**Desk review of the coverage and use of sustainable development information:** coverage of, for example, pressures/driving forces, current state and changing responses; how information flows and who is involved; links to decision-making; evidence of changing demand for sustainable development information from decision-makers; problems of data availability, reliability, and so on **Multi-stakeholder workshop** can reveal key issues on information and its use
12 Monitoring, learning and accountability mechanisms for sustainable development	**Desk assessment and key informant interviews on monitoring systems (internal and external) used** by key bodies and their links to policy, planning, investment and management systems. Assess coverage of strategy implementation and impact monitoring, procedures for data quality assurance, including adequate participation in monitoring. Assess evidence of changing demand/use of information generated; quality and regularity of updates; sanctions applied. Ask where learning on sustainable development has come from – own experience, other strategy-organized experience, or from external constructs and initiatives

Four steps to assessing how the legal environment enables sustainable development – or not

STEP 1 IDENTIFY THE COMPONENTS OF A COUNTRY'S LEGAL FRAMEWORK THAT ARE RELEVANT TO SUSTAINABLE DEVELOPMENT

The first step is simply a matter of defining the 'legal playing field' – what is the relevant legal framework? The answer to this is often wider than is assumed. For example, a country's sectoral legislation on forestry cannot be understood in isolation from numerous other sectoral or general laws, including the constitution; laws on taxation, investment, transport, credit, companies and associations; laws on environment, land use and tenure, soil conservation, water, wildlife and plant protection; and international agreements to which the country may be a party. Various customary laws may also apply. Even where (as in many countries) the official status of customary law is ambiguous, it often continues as a matter of practice to shape people's behaviour, and therefore needs to be included.

STEP 2 ANALYSE THE SUBSTANCE OF THE LAW

The overarching issue here is: to what extent do the laws identified in Step 1 allow, encourage, constrain or prevent the types of activities on which a sustainable development strategy is focused?

- *Is the law relatively free of unnecessary regulatory constraints that could inhibit activities essential for achieving sustainable development*? Regulatory obstacles can take many forms: for example, bureaucratic procedures that increase the transaction costs of a particular activity, without a corresponding public benefit. Every legal system contains examples of well-intended laws surrounded by excessive procedural hurdles that make them extremely difficult to use.
- *Does law provide an appropriate positive regulatory environment for activities in support of sustainable development*? While over-regulation or inappropriate regulation can stifle initiatives, the absence of a suitable regulatory framework can be equally debilitating. Many of the more important activities that flow from a particular strategy choice will need to be supported or guided by a body of predictable, understandable and enforceable rules. Issues that frequently come up in connection with the promotion of sustainable development include whether there are appropriate rules:
  - for ownership of property – as Hernando de Soto (2000) has noted, many people in developing countries face multiple legal and bureaucratic hurdles which make property ownership impossible, so that they cannot use their potential capital assets;
  - governing access to and management of public goods;
  - concerning the externalities of public and private actions;
  - governing the behaviour of government officials, to ensure basic limits on the exercise of discretion, and to support transparency and accountability;
  - ensuring a right of meaningful participation, including access to information.
- *Are the mandates for different institutional actors clear, coordinated and desirable*? Laws may leave it unclear, for example, which agency has the power to make certain decisions. The result could be that a key government stakeholder whose action is critical to the success of a particular strategy component may find that its authority is open to challenge. In other contexts, the legal allocation of authority may be fragmented among different sub-agencies that do not function well together.
- *Does the law enable the formation and empowerment of appropriate stakeholder organizations*? The question for legal analysis is whether there is a legal basis for the creation or recognition of such institutions, and for the vesting in them of real rights, powers and responsibilities. If the law treats them essentially as non-entities, their capacity and incentive may be significantly constrained.
- *Does the legal framework provide mechanism(s) by which people can obtain meaningful and secure rights to the assets essential for sustainable livelihoods*? Many national legal frameworks fall far short of supporting sustainable access to and secure rights over land, trees, water and other resources for rural stakeholders, and in fact may criminalize the exercise of locally recognized rights.

STEP 3 ANALYSE THE LAW-IN-ACTION

The substantive content of law is, of course, only part of the story. It is also important to try to assess the actual *effect* that relevant laws have on the ground – in what ways do they influence the behaviour of individuals and institutions? A particular law may fall short of its intended purpose or have quite unintended secondary effects, for a number of reasons, such as:

- *Lack of political will:* Many good laws are simply not implemented.
- *Failure to anticipate the costs of effective implementation:* Many ambitious laws lie unimplemented or under-implemented.
- *Failure to recognize the limitations of legal reform in bringing about social and economic change:* Laws that require sudden changes in deeply ingrained behaviour may prove difficult to implement.
- *Lack of understanding or acceptance of the law by various stakeholders:* As a result, there is insufficient support for the law among those stakeholders most directly affected.

Table 5.13 Questions asked about strategy quality by the OECD DAC initiative

Topic	Issues to be explored
1 Political and institutional enabling conditions	What are/have been the **priorities of present and past governments**? What key policies, strategies and initiatives have been put in place? What are the historical, political and administrative contexts in which **previous attempts at integrated strategies** have originated and been developed and implemented? Is there **political commitment** to the objectives, processes, plans and budget requirements of all strategic initiatives concerned with sustainable development? In what political fora? Is the political commitment partisan or broad-church? What are the sticking points? Is it clear where **responsibilities** lie for building on existing strategies and their activities, for formulating new strategies where relevant, for implementing them and for monitoring them? Do the institutions concerned have sufficient **rights, resources and effective relationships** to undertake this? (The 4Rs.) Is there effective **coordination**: ■ between these institutions; ■ between strategic initiatives, for example NCS or social action plans; ■ between these institutions and those central to planning and investment; ■ between institutions and donors? How do **national, local and regional strategies relate** to each other and how do existing strategies link into the planning and decision-making systems? What **cross-boundary, regional and global** issues have been considered? (eg conflict, free trade areas, legal agreements, cross-border ethnic groups, development aid and debt)
2 Quality of analysis	Is there adequate **understanding of the state of resources**, trends in their quality and quantity, and the pressures upon them? Is there adequate analysis of the **state of the main sectors and livelihood systems**, their interactions with resources (as above), and consequent winners and losers? Has full use been made of **existing studies on poverty and environment**, and the opportunity taken to strengthen the body of knowledge in concerned areas?
3 Quality of participation	Is there **continuing identification and participation** of concerned stakeholders – including government, civil society and market players at different levels, and representatives of global environmental interests – in strategy preparation, planning, implementation, monitoring and review? Do the fora and mechanisms suit the stakeholders? Does representation meet acceptable criteria of identity-with-group and accountability-to-group? Have **proactive mechanisms** been used to engage otherwise marginalized stakeholders in the above processes – such as women and landless poor groups? What role did public awareness campaigns have in encouraging stakeholder involvement in the process and how has the process strengthened people's participation in, and influence over, the decision making process? How were difficulties and problems addressed and consensus reached?
4 Quality of policies and plans	Have clear **policies, plans, principles, standards and/or targets** been derived from the strategy, in forms which can best elicit positive responses from those various institutions (government, market and civil society) which are supposed to implement the strategy? Are there **systems for defining priorities** in environmental, economic and social terms, so as to keep the number of strategy objectives (at any one time)

	manageable? And are these systems compatible with those for analysis and participation? Have **opportunities for win–win** activities supporting poverty alleviation, economic growth and environmental conservation been well defined with those institutions best placed to act on them? For example, have conservation and poverty alleviation strategies been brought together? Are there **systems for addressing the hard trade-offs** – identifying them, debating them, planning action or compensating for the costs of inaction? Has there been **early and tactical implementation of promising initiatives** which will both help build support for the strategy process and test its principles and ideas?
5 Effectiveness of regulations and incentives	Do fiscal and regulatory frameworks **internalize social and environmental costs** in order to correct for market failure, and open doors to best-practice investment? Are these frameworks efficiently **monitored and enforced**, by government or private bodies as appropriate? Have measures been included to ensure **compliance with international** environmental and human rights agreements? Are measures taken to increase public awareness of sustainable development and thus encourage the development of **consumer- or civil society-driven incentives**?
6 NSDS process management and effectiveness of capacity	What key factors assisted the development of the strategy (eg a past strategy, public pressure, government commitment) and what were the key issues to resolve (eg land tenure, resource depletion, poverty)? From what perspective has the process been driven (environmental, economic, interdisciplinary)? What tools/methodologies were useful in enhancing understanding (eg poverty assessments, SEA)? How is progress being monitored? Is capacity being efficiently and equitably utilized, and improved, to: ■ develop strategies with strong local ownership; ■ coordinate existing sectoral or issues-based strategies to improve their coherence and efficiency in achieving SD; ■ encourage institutions to make their responses to relevant strategies; ■ implement strategy-related activities, in a way that is consistent with the broader strategy goals; ■ monitor the impact of strategic mechanisms and activities; ■ maintain the 'big picture' of strategy evolution; ■ review and continuously improve the strategy?
7 Evidence of impact	What areas do stakeholders believe are being influenced – positively or negatively – by the strategy, for example: ■ Ecological processes conserved? ■ Biodiversity conserved? ■ Resource quantity/productivity maintained? ■ Economic efficiency improved? ■ Poverty and inequity reduced? ■ Pollution prevented? ■ Human health improved? ■ Culture conserved?
8 Donor roles	What has been the role of donors in these mechanisms and was their role useful? Is there effective coordination between government and donors?

Note: These questions complement those of Table 5.12, by offering questions on enabling conditions, quality of resulting plans, policies, regulations and incentives, and strategy process management. As such, it can also be useful in monitoring strategy implementation (page 320).

Source: IIED (2000)

Box 5.18 SWOT analysis (strengths, weaknesses, opportunities and threats)

SWOT analysis is a strategic planning tool for analysing the strengths, weaknesses, opportunities and threats of any institution, community or initiative. Strengths (ie capacities, contacts, resources, etc) and weaknesses (ie diminishing ability to provide quality services) refer to internal factors. Opportunities (a combination of circumstances which, if accompanied by a certain course of action on the part of the community, is likely to produce benefits) and threats (probable events which, if they were to occur, would produce significant damage to the initiative) refer to outside influences. SWOT analyses can be highly structured and thorough, or unstructured and general.

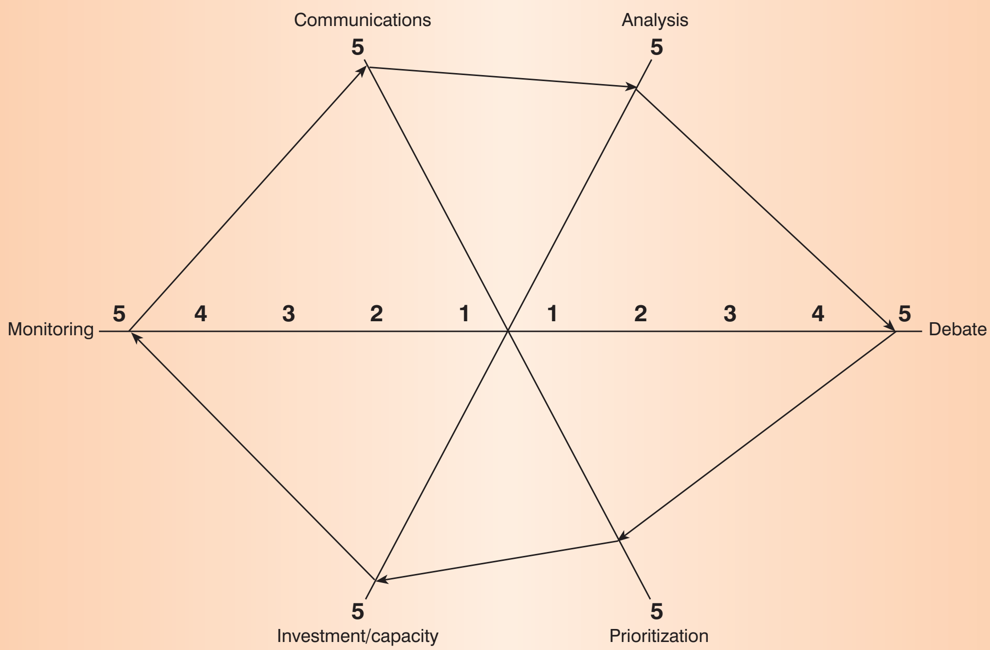
SWOT analysis produces a comprehensive list of strengths, weaknesses, opportunities and threats, which will aid in the formulation of attainable long-range goals, action programmes and policies.

It may be expanded as SWONT analysis – including an assessment of current 'needs'.

Source: ICLEI (1996a)

- *Weak judicial institutions and underpowered alternative fora:* In many countries, the resolution of legal disputes is the responsibility of a court system that is over-burdened and under-financed.

This part of the legal analysis cannot rely entirely on a review of written instruments and cannot be undertaken only by legal experts. It needs to be nested within a multidisciplinary effort to assess the perceptions, activities and interactions of the main stakeholders.



Method: The strategy mechanisms are each accorded a 'spoke' in the 'wheel', eg six mechanisms are considered in the above. Focus groups or interviewees assess the type of participation on each 'spoke' starting from the centre. Five types/intensities of participation can then be suggested:

1 **Compliance:** tasks are assigned; outsiders decide agenda and direct the process

2 **Consultation:** local opinions are asked, outsiders analyse and decide the course of action

3 **Cooperation:** local people work with outsiders to determine priorities; joint responsibility with outsiders to direct the process

4 **Co-learning:** local people and outsiders share knowledge, create new understanding and work together to form action plans; outsiders facilitate

5 **Collective action:** local people set their own agenda, mobilize in the absence of outside initiators

The reasons for different participation types/intensities, and problems and opportunities arising, can then be discussed.

Source: Adapted from Kanji and Greenwood (2001)

Figure 5.14 Mapping the type/intensity of participation in strategy mechanisms

STEP 4 ASSESS THE FEASIBILITY AND PRIORITY OF ADDRESSING THE LEGAL CONSTRAINTS

Once the constraining features in the legal framework have been identified, the next step is to analyse how to correct those features, or at least to mitigate their impact. A key question is how high a priority to assign to any particular legal deficiency: to what extent can they be, or will they have to be, 'lived with'? To what extent are they such fundamental threats to strategy goals that they will need to be addressed in a forthright fashion? Here, two somewhat countervailing considerations should be kept in mind:

- On the one hand, it is important to be realistic in analysing the importance of a law. No legal system is flawless, and it is often possible to achieve promising development results in a less-than-ideal legal environment.
- On the other hand, although it may be possible to side-step legal problems for the time being (especially where there is a lot of powerful, high-profile support), there may well be difficulties in sustaining and mainstreaming early successes, unless the more significant problems are dealt with in a forthright manner. A basic rule of thumb is that when the initial wave of enthusiasm for a particular activity begins to wane, legal weaknesses are more likely to come to light and to be exploited.

Analysing the economic context

Two tasks for assessing the wider economic context for sustainable development

One important factor that will determine the feasibility of legal reforms, or the viability of investment, is the wider economic context. As noted above, laws need to be designed with an eye to their cost and their impacts on different groups, as well as their clarity, coherence and consistency with social norms. Similarly, investments will only succeed if they work with, not against, the underlying economic forces that lead people to behave in particular ways.

TASK 1: IDENTIFY MAJOR TRENDS THAT ARE LIKELY TO AFFECT SUSTAINABILITY

Developing sustainable development strategies requires a clear vision of where the world, the nation, and the community are headed. One of the most important factors is population growth, which will determine the overall level of demand for goods and services, and thus the pressure on natural resources and the environment. Closely related to this is human migration and urbanization, which will affect the pattern of settlement and employment, the available mix of skills, links to other communities and nations and, of course, the nature of environmental problems (eg urban transport and waste management versus rural land degradation and deforestation).

In addition to the size and geographic distribution of the population, consumer demand also depends on the level and distribution of income. This is both a policy target – something to increase or equalize – and also a determinant of sustainable development strategies. Rising incomes will increase demand for consumer goods, but also for environmental amenities. This may create new opportunities for more sustainable enterprise, such as ecotourism; although, if everyone seeks to take advantage of such opportunities at once, the market will quickly become saturated. Another, less desirable feature of many developing economies is rising inequality in income, which may influence political priorities and the relative feasibility of alternative environment and development options. The same applies to other broad economic trends such as the liberalization of trade and investment regimes, or the spread of modern information technologies.

TASK 2: WORK WITH, RATHER THAN AGAINST INDIVIDUAL INTEREST AND MARKET FORCES

Mechanisms to facilitate the transition to sustainability will have a greater chance of success when they work *with* individual interests and market forces, rather than trying to restrain or obstruct the activities of producers and consumers. Of course, people do not always behave according to economic theory; that is, as atomistic, purely self-interested, rational calculators. Nevertheless, it is unwise to expect people to undertake actions that impose significant costs on themselves, on an ongoing basis, without clear and commensurate benefits. Likewise, where there are opportunities to secure significant gains at minimal personal risk, even where this involves behaviour that is illegal, immoral or imposes costs on others, it is highly likely that someone will take advantage, sooner rather than later. In short, while people are not all completely self-centred, they are not entirely altruistic either, and public policy needs to reflect human frailty.

In recent years, this simple insight has led to increasing reliance on the motivating force of self-interest, as expressed in the market place, as the main engine of economic development. Thus, the more 'liberal' economic policies governing international trade and investment have been widely embraced, increasing reliance on private firms to provide public services, and similar reforms. In the environmental sphere, the same trend can be seen in the growing reliance on 'market-based instruments' (MBIs) to reduce pollution and waste, or to improve the management of natural resources. Such instruments take advantage of self-interest, as well as differences among producers in the relative costs of meeting environmental aims, in order to reduce the overall costs of environmental protection. Well-designed MBIs can also help to stimulate ongoing innovation and further cost reductions over time, through the competitive pressure of market forces. MBIs include not only punitive measures to discourage environmental 'bads', such as pollution taxes, but also positive incentives to encourage the production of environmental 'goods', such as payments for watershed protection in upland areas, or the premium paid for organic food that protects wildlife and water resources.

Describing how the mechanisms link up

Two tasks for assessing how the mechanisms hold together in a decision-making system for sustainable development

TASK 1: DESCRIBE HOW THE INDIVIDUAL MECHANISMS LINK IN PRACTICE

The analyses suggested in the previous sections may reveal a number of promising mechanisms as well as problems with gaps, inconsistencies and overlaps. If the task is to pull together a coherent strategy system, however, it may not simply be a task of arbitrarily assembling the best components. Some analysis is required of what holds the mechanisms together – a conception of the overall policy process towards sustainable development.

A flow diagram could be constructed using Figure 5.14 as an example. If done by a small, multi-stakeholder focus group, it could both produce a picture of the current decision-making system for sustainable development and provide a useful learning exercise – some of the stakeholders may perceive the process differently, or not be aware of all the aspects of the system. The flow diagram should describe the actual situation – which may bear little relation to the provisions of any (paper) strategy or procedure.

TASK 2: DESCRIBE THE OVERALL INSTITUTIONAL LANDSCAPE FOR SUSTAINABLE DEVELOPMENT

A sustainable development strategy aims to change the norms and behaviour of groups, and their relationships, so that sustainable development can be achieved – in other words, to develop the overall institutional landscape (the 'meta-institution') of sustainable development, and to help other institutions to play their role within it.

The analyses above will have begun to clarify which institutions are central both to the sustainable development discourse and to the mechanisms required for sustainable development. Stakeholder power analysis (page 127) will also have revealed both the dominant institutions and those who are excluded from decision-making but have potential for sustainable development.

Institutions may then be profiled in relation to the sustainable development strategy. This entails identifying which specific government, civil society and private sector institutions have been playing a part in all or many of the sustainable development mechanisms identified through Task 1; why they play these roles; and with whom they play them – the main alliances. Furthermore, it can go on to identify the strengths and weaknesses of individual institutions in contributing to these strategy mechanisms. This work is best started as a focus group exercise, adding the details through interviews. It will begin to show which institutions are dominant in the discourse and the emerging institutional landscape. It could be expressed as:

- *a flow/process diagram* showing information flows between institutions and what happens to the information (joint decisions, alliances, conflicts, joint work, etc) (Figure 5.15);
- *a Venn diagram* showing the nature of the links between actors: for example, membership in informal 'policy communities' or formal 'NSDS committees';
- *a matrix* (with the same institutions on both x and y axes and the synergies, clashes and joint initiatives in the 'cells' – see section on identifying stakeholder interests, relations and powers, page 127).

Scenario development

The purpose and limitations of scenarios

The construction of scenarios can play an important role in strategic planning and policy-making. In effect, scenarios are a form of SEA (page 149). They are powerful tools for addressing what is both fundamentally significant and profoundly unknowable – the future (WBCSD 1997). Whereas forecasts predict patterns extrapolated from the past into the future, scenarios present plausible, pertinent, alternative 'stories'. They rely on imaging the future, rather than extrapolating from the past. Yet they are not predictions, but are means to explore options and test their robustness or sensitivity. As such, they can help to build the capacity to assess change, to look for major shifts rather than assume continued trend, and to build creativity and resilience to deal with such shifts. The assumptions behind each scenario are as important as the scenario itself and need as much discussion.

Scenarios imagine the future and explore options …

Scenarios might regularly be developed to assist in NSDSs by considering the likely environmental, social and economic consequences of trends in key variables such as demographics, political risk, consumption and production, and/or the consequences of taking particular actions or policy options. Different scenarios can be constructed to maximize, minimize or optimize the environmental, social and economic consequences as appropriate.

… and help consideration of the consequences of trends

Different scenarios are often developed for the near future (less than 5 years hence), the medium-term future (10–15 years) and the longer-term future (25 years or more).

However, the longer the period for which projections are made, the more problematic the task since a lot can happen over that time, and the unexpected is always likely to happen, as experience from India shows (see Box 5.19). As such, scenarios should not be treated or communicated in ways that make stakeholders perceive them either as forecasts or as strategy visions.

Organizing scenario development

Scenarios depend on good knowledge of the past and present, and good judgement about the issues that may matter. Scenario approaches can be expert-based (in which case multiple disciplines are desirable, to be able to assess the multiple dimensions and access/interpret data) or participatory in the sense that stakeholders get together to develop an exercise (in which case professional facilitation is desirable).

Box 5.19 Futurology: experience from India

In 1970, a group of Indian scholars produced an eight-volume report (the *Second India Study*, see Ezekial 1975) assessing the implications of the doubling of India's population that demographers in 1970 had considered inevitable. The study predicted a range of scenarios, some of which have materialized, and others which have not. A follow-up study compared the predicted scenarios with actual developments (Repetto 1994) and showed how the authors of the original study *failed to include some significant events:* oil price changes; the globalization of the economy; and India's move away from a centrally planned regime.

As a result, the capital and resource requirements and environmental impacts of India's growth were substantially less than predicted. Indeed, neither technology nor resources were the main problem – where development has faltered, the stumbling blocks have usually been institutional and policy-related.

Scenario descriptions must be useful …

The descriptions of alternative scenarios need to be useful to many people involved in strategy debate and decision-making. Thus they should be (Brown 2001):

- understandable to the layperson;
- distinct from one another;
- possible and realistic;
- clear;
- substantiated by existing information where possible.

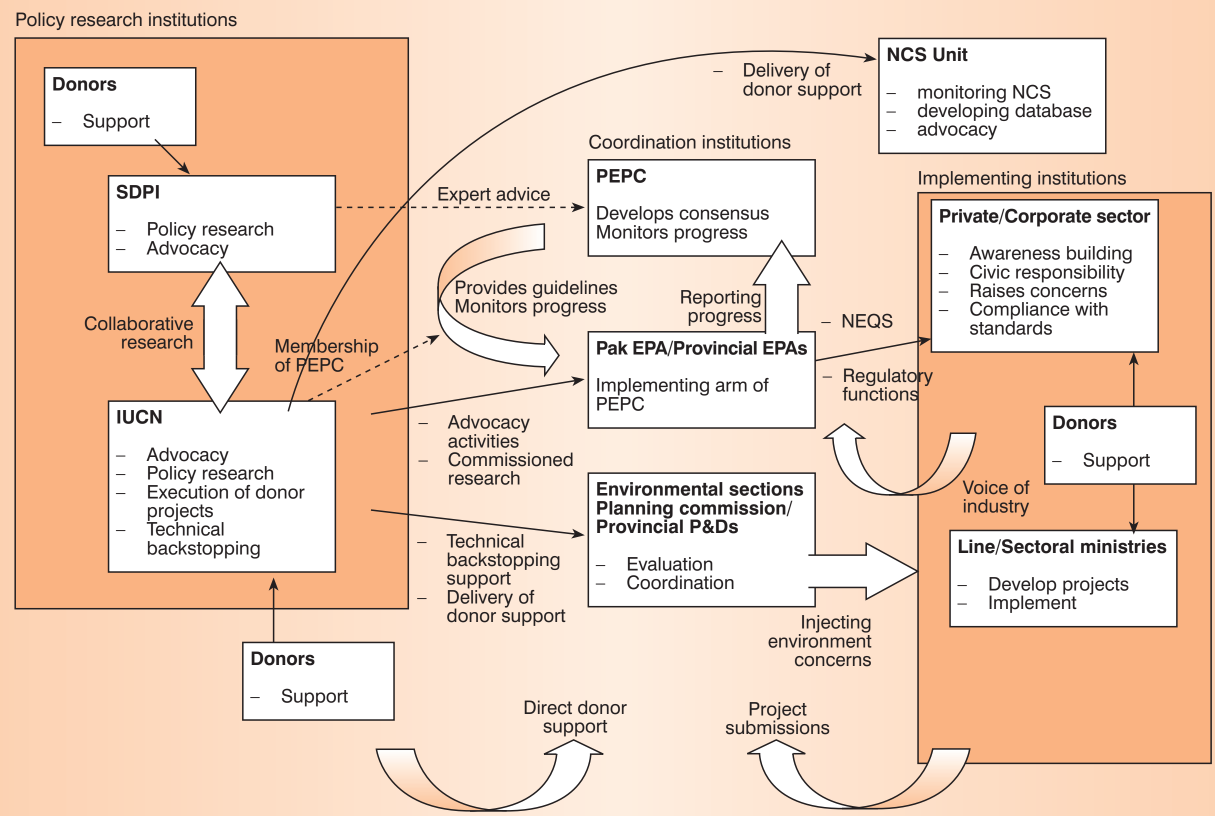


Figure 5.15 Institutional mapping: relationship chart of the entities involved in the implementation of the Sarhad Conservation Strategy

… and reflect societal values

For an NSDS, the scenarios should reflect general societal values within the nation but with a very strong component of global coverage. Usually three scenarios will be enough to be able to think through alternative courses of action. These may often be:

- 'no change' or trends continued;
- 'much better' or a picture based on positive societal change to deal with problems;
- 'much worse' or a negative societal picture where problems are not dealt with and possibly spiral out of control.[8]

Each scenario can be described in narrative (and sometimes map-based) terms, but such a description should also be summarized in terms of key dimensions: for example, levels of GDP, population or poverty indices. The effects of the scenario may then be judged in terms of sustainability criteria, such as those suggested in 'Approaches to measuring and analysing sustainability' on page 131. It may then be possible to rank the scenarios according to such sustainability effects (environment, social and economic – or human and ecosystem well-being). Finally, good communication of the scenarios and their analyses is all-important, both so that they can be used by policy-makers (or business managers) and to avoid misperceptions.

Some illustrations of sustainable development scenarios

The private sector uses scenarios a lot for business planning

Global scenarios have stimulated debate on sustainable development

There is considerable experience in the use of scenario planning in the private sector. For example, Shell International (still considered by many to be a leader in the field) has developed global scenarios for 1995–2020 to help prepare for discontinuities and sudden change, to create unifying themes and images, and to help foster cohesion within the company (Shell International 1996). The scenarios envisage two possible futures (Box 5.20) built on a recognition that 'There Is No Alternative' (TINA) to adapting to three powerful forces: liberalization, globalization and technology. They consider the political, social, business and economic systems best able to exploit the forces of TINA. Shell has also drawn up scenarios for individual countries, such as China, Russia, South Africa and Nigeria. The Nigerian scenarios were presented to a government audience in Lagos as a non-controversial way of introducing potentially unpalatable ideas.

In 1997, the World Business Council for Sustainable Development (WBCSD) also experimented with a set of three global scenarios that explore and aim to stimulate broad discussion on possible responses to the challenge of sustainable development (WBCSD 1997) (Box 5.20). The WBCSD recognized that scenarios have various applications:

- to enrich debate and widen the 'strategic conversation' in an organization, with the aim of bringing new concepts and understanding to users and, ultimately, to change mental maps;
- to search for corporate resilience, including making risky decisions more transparent by identifying threats and opportunities and the creation and assessment of options;
- to trigger a formal strategic planning process, including the assessment of existing strategies and plans.

8 Extreme scenarios are often presented to provoke reaction. For example, in an exercise aimed at land use planning and resources protection in Gaza, three different socio-economic development scenarios were formulated. Each of them was based on a set of quite extreme assumptions 'to ensure that real development in the future will be at least somewhere in between the extreme conditions considered' (EPD 1996).

Box 5.20 Global scenarios

(i) Shell Global Scenarios 1995–2020

In the first scenario – *Just Do It!* – success comes to those who harness the latest innovations in technology to identify and take advantage of quick-moving opportunities in a world of hyper-competition, customization, self-reliance and ad hoc informal networking. This world allows the fullest expression of individual creativity and offers a large stage for exploring visions and for new ways of doing business and solving problems.

In the second scenario – *Da Wo ('Big Me')* – countries and companies discover that success calls for a committed investment in relationships, where relationships of trust and the enabling role of government provide the long-term strategic advantage. In this world, Asia already has an advantage because its societies and businesses are at home in a world in which the individual – the 'small me' – understands that individual welfare is inextricably linked to the welfare of the whole – Da Wo ('Big Me').

Source: Shell International (1996)

(ii) World Business Council for Sustainable Development: Global Scenarios 2000–2050

- In **FROG** (First Raise Our Growth) the responses are inadequate – the human social systems are unable to meet the challenge of sustainable development, a challenge made more difficult by a vulnerable natural system.
- In **GEOpolity** the response is to build an interlocking governance structure coordinated at the international level.
- In **Jazz** (diverse players form alliances and work together; there is innovation, experimentation, rapid adaptation and much voluntary inter-connectedness; high transparency; dynamic reciprocity) markets are harnessed for finding solutions to sustainable development.

Source WBCSD (1997)

(iii) Stockholm Environment Institute: Global scenarios

A taxonomy of scenarios is set out based on a two-tier hierarchy: classes distinguished by fundamentally different social visions and *variants* reflecting a range of possible outcomes within each class. Three broad scenario classes are depicted:

- **Conventional Worlds** – essential continuity with current patterns. Envisages the global system of the 21st century evolving without major surprises, sharp discontinuities or fundamental transformations. The future is shaped by the continued evolution, expansion and globalization of the dominant values and socio-economic relationships of industrial society.
- **Barbarization** – fundamental but undesirable social change. Envisages the grim possibility that the social, economic and moral underpinnings of civilization deteriorate, as emerging problems overwhelm the coping capacity of both markets and policy reforms.
- **Great Transitions** – fundamental and favourable social transformation. Explores visionary solutions to the sustainability challenge, including new socio-economic arrangements and fundamental changes in values. These scenarios depict a transition to a society that preserves natural systems, provides high levels of welfare through material sufficiency and equitable distribution, and enjoys a strong sense of social solidarity. Population levels are stabilized at moderate levels and material flows through the economy are radically reduced through reduced consumerism and massive use of green technologies.

Source: Gallopin et al (1997)

Other work on the process of global and regional scenario development, and associated policy analysis and public education, has been carried out by the Global Scenario Group of the Stockholm Environment Institute. Reporting on this work, Gallopin et al acknowledge that the forces of globalization take many forms – stresses on the biosphere, far-reaching cultural impacts of communications technology, expansion of worldwide commerce, and rise of new geo-political tensions (Gallopin et al 1997). They argue that, as a consequence of these forces, the world is at an uncertain *branch point* from which a wide range of possible futures could unfold in the next century. These are explored and their implications considered (see Box 5.20).

In the European Union, such strategic analysis is an important step in the process of strategic planning. Here there has been an increasing interest in the use of scenarios as a way of dealing with the inherent complexity of sustainable development at the European level, and for pinpointing gaps, inconsistencies and dilemmas in existing policy-making. Box 5.21 describes two examples of such scenario-based planning: one undertaken by European Partners for the Environment (EPE), a grouping of representatives of business, trade unions, public authorities, research organizations and environmental groups; the other by Consultative Forum, established by the European Commission to bring together 'wise people' from similar groups to provide advice on how to progress towards sustainable development.

Scenarios can help to deal with the complexity of sustainable development at the regional level

Box 5.21 European scenarios

European Partners for the Environment (EPE)

Set up in 1993, EPE brings together business, trade unions, public authorities, research organizations and environmental groups, to catalyse common action for sustainable development. One of its first outputs was a workbook, *Towards Shared Responsibility*, which includes a scenarios module (EPE 1994). Its aim is to encourage participants to take a more experimental approach to the sustainability agenda, to consider the likely evolution of this agenda under different social, political, economic, technological and environmental conditions, and to examine the implications for action. The module puts forward three contrasting scenarios for a generation in the future:

- Scenario 1 – *No Limits:* Characterized by rapid change, technological innovation, adaptation to environmental problems, cultural diversity and focus on individual quality of life. This is essentially a liberal free market vision of the future.
- Scenario 2 – *Orderly Transition:* Characterized by an emphasis on stewardship, managerialism, scientific expertise and balancing environment and the economy. This is more or less the vision of the European Fifth Environmental Action Programme.
- Scenario 3 – *Values Shift:* Characterized by a stress on prevention, the urgency of environmental problems, participation, decentralization and a focus on equity and community.

Consultative Forum on the Environment

The Consultative Forum was set up by the European Commission to bring together 32 'wise people' from business, trade unions, local government, research and environment organizations to advise the EC on how to progress towards sustainable development. After drawing up a range of policy statements, the Forum carried out a scenario exercise, Vision 2020, using a similar methodology to EPE (Robins et al 1996):

- Scenario 1 – *Opening Opportunities:* Environmental problems are addressed through innovation and market-friendly policies and a drive towards a dematerialized information economy. The Rio logic of resolving environmental problems through regulation and public spending is discredited.
- Scenario 2 – *Managing the Transition:* The market alone is seen as unable to solve society's problems and a stronger government role is taken to steer the economy to achieve jobs and environmental improvements.
- Scenario 3 – *Transforming Communities:* Societal tolerance for social and environmental decline reaches its limit and a new approach is taken to development, focused on stronger communities, quality of life and simpler lifestyles.

The Forum used these scenarios to draw up a set of recommendations for future EC action, including setting up a sustainability task force to develop new and innovative solutions; publishing a regular sustainable development report; establishing a 'House of the Future' to stimulate thinking; preparing a strategy on the EU's foreign policy and sustainable development; and supporting a larger role for local communities in EC policy-making (EC 1997). Commenting on the initiative, the EC's Environment Commissioner, Ritt Bjerregaard, concluded that 'the scenarios paper shows very clearly that sustainability needs more and more to take centre stage in policy-making'.

Sources: EPE (1994), EC (1997)

Another excellent example of scenario planning comes from work undertaken in South Africa preceding the end of apartheid. A group of people, supported by the Anglo American Corporation, conducted pioneering scenario work to help examine post-apartheid South Africa's choices for the future, embracing political, social, economic and environmental issues. Their analysis (Huntley et al 1989) provided a powerful argument to end apartheid and join with the rest of Southern Africa to face the environmental challenges of the 21st century (see Box 5.22).

Box 5.22 South African scenarios

Analyses undertaken in South Africa by Huntley et al (1989) considered 'both global and regional trends in environmental health, from the potential holocaust of a 'nuclear winter' to the insidious invisible threat of the 'greenhouse effect' and the ozone hole'. Against this background of possible global environmental issues, the boundary 'rules of the game' for South Africa were analysed. These included:

- its basic geography;
- the diversity of landscapes, habitats, fauna and flora;
- the climate and weather cycles;
- population dynamics and settlement patterns;
- distribution of key natural resources – minerals, water and arable land;
- agricultural and forestry resources;
- homeland (communal land) poverty;
- marine resources;
- economic growth and consumption patterns.

Two key uncertainties were identified:

- the different socio-economic paths that the country might adopt;
- the different environmental management ethics that might emerge.

These were used to derive four possible environmental scenarios in the early 21st century:

1. '*Paradise Lost*' associated with a regional wasteland.
2. '*Separate Impoverishment*' resulting from continuing down the '*Low Road*' (stagnation of the political reform process, big government, more centralized economy and siege mentality).
3. '*Boom and Bust*' where the nation's natural resources were plundered to achieve maximum short-term economic gains resulting from the '*High Road*' (negotiated political settlement, multi-party political system, decentralized power, free enterprise, mass education, etc).
4. '*Rich Heritage*' where sustained development was pursued along the '*High Road*'.

Taking this process further, Sunter (1992) looked at the future South Africa in relation to Southern Africa and the greater world. Here, he saw the 'High Road' as potentially closing the gap between the rich and the poor nations, and the 'Low Road' as allowing that gap to increase with 'dire consequences for the stability of the world'.

Source: Huntley et al (1989); Sunter (1992)