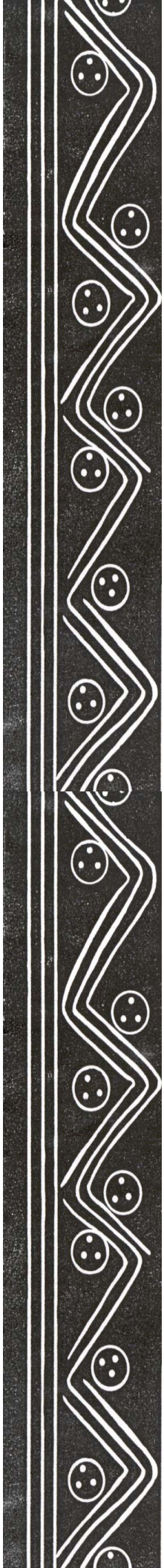

IUCN RESOURCE KIT FOR SUSTAINABILITY ASSESSMENT

Part A: Overview

Based on the work of the IUCN / IDRC Sustainability Assessment Team

Compiled and written by Irene Guijt and Alex Moiseev with Robert Prescott-Allen

IUCN Monitoring and Evaluation Initiative

May 2001

IUCN
The World Conservation Union

IUCN – The World Conservation Union

Founded in 1948, The World Conservation Union brings together States, government agencies and a diverse range of non-governmental organizations in a unique world partnership: over 980 members in all, spread across some 141 countries.

As a Union, IUCN seeks to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

The World Conservation Union builds on the strengths of its members, networks and partners to enhance their capacity and to support global alliances to safeguard natural resources at local, regional and global levels.

The IUCN Monitoring and Evaluation (M&E) Initiative

The mandate of the Monitoring and Evaluation Initiative is to establish a Monitoring and Evaluation System for IUCN that:

- Supports learning, improvement and accountability through regular reviews of the relevance, effectiveness, efficiency and impact of IUCN's work at project, programme and organizational level;
- Promotes a learning culture of self-assessment, reflection and internal review as well as external reviews;
- Provides training and capacity building for IUCN managers in evaluation and self-assessment.
- Support the implementation of the IUCN Evaluation Policy and Standards.

Publications from the M&E Initiative are available on-line on the IUCN Website:
http://www.iucn.org/themes/eval/index.html

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Forward and Acknowledgements

IUCN became interested in the need to develop an approach to assessing sustainability in the early 1990s after a decade of supporting over 75 National and local Conservation Strategies and Strategies for Sustainable Development in partnership with many donors and country governments.

In 1992-93 IUCN hosted a series of workshops with strategy practitioners in Africa, Asia and Latin America to assess the progress of national and local strategies. While it was evident that many of these strategies led to considerable activity focused on sustainable development, practitioners had no real way of assessing whether these strategy efforts were making a difference to the baseline condition of people and their environment. Were things getting better or worse? Should they change the focus of their strategies to address different issues? Practitioners in Asia, Africa and Latin America unanimously called for assistance in developing practical methods and tools to monitor and assess progress towards goals of sustainable development.

No 'off the shelf' methods suited the assessment of sustainable development. Methods either focused solely on environment (such as State of Environment reporting), or on people in isolation from their environment. Committed to an approach that responded to the needs of practitioners and that supported practical use, IUCN set out to develop a user-focused approach to assessing progress towards sustainable development goals.

From 1994-1997 IDRC (The International Development Research Centre) supported both pilot field work in Asia, Africa and Latin America and the conceptual work of an International Assessment Team – a team of remarkable individuals with extensive experience in assessment and evaluation, development, communications and mapping in many parts of the world. They worked alongside the pilot field teams in Asia, Africa and Latin America listening, learning, developing and testing a set of methods and tools that were combined into what was then called System Assessment, and is now called Sustainability Assessment or Wellbeing Assessment as used in the Wellbeing of Nations global assessment (Prescott-Allen 2001).

For their conceptual guidance in the early development of this methodology we are very grateful to the members of the International Assessment Team - Ashoke Chatterjee (India), Alejandro Imbach (Costa Rica), Diana Lee Smith (Kenya), Eric Dudley (UK), Adil Najam (Pakistan and US) Tony Hodge and Robert Prescott-Allen (Canada).

Terry Smutylo and Fred Carden of the IDRC Evaluation Unit provided both conceptual guidance as well as financial support throughout both phases of the Assessing Progress Towards Sustainability Project. They continue to play an important role in the development of the Monitoring and Evaluation System for IUCN. Don Peden from the Programmes Branch of IDRC also provided valuable support in the second phase of the project. We are very grateful to IDRC for recognizing the important role that assessment can play in development and for investing in the development of new approaches to assessing sustainability.

In the second phase of the IDRC project, Robert Prescott-Allen in particular provided substantive insights for the latter stages of the methodological development both through further IUCN field work as well as through his own independent assessment work. This was published as The Wellbeing of Nations, an independent global assessment of the human and ecosystem wellbeing of 180 nations, by Island Press, September 2001.

The pilot field teams working on local sustainable development strategies and projects, provided invaluable feedback and critical insights. Our thanks go to:

- In Colombia, the Monitoring and Evaluation Unit of the Fundación pro Sierra Nevada de Santa Marta: Natalia Ortiz and Hernando Sanchez
- In Zimbabwe, the IUCN Assessment Team: Sam Chimbuya, Carmel Lue-Mbizvo; the District Environmental Action Planning (DEAP) Core Team: Elliot Mhaka, Cephas Chidenga, Joseph Chizororo, Peter Gambera, Davison Haukozi, Zii Masiye, John Mbetu, Constantine Mushure, Aaron Tshabangu and Unity Tshabangu
- In India, the Development Alternatives team working on district level planning with communities and officials in Tumkur District, Karnataka State: C. Ashok Kumar, Vijay Pillay, V. A. Abraham, Subash Marcus and George C. Varughese.

Bill Jackson, former IUCN M&E Facilitator for East and Southern Africa, and Andrew Ingles, Head, Asia Regional Forest Programme, were particularly helpful in advising on key aspects of the methodology as it was being developed, and in using the concepts and methods in their work in Asia and Africa.

Once the methodology had been developed and tested in pilot sites, and disseminated widely through the IUCN networks, the real test was to see if practitioners would pick up the method and find it useful in their work. A number of people were instrumental in picking up the concepts and methods and further adapting them in practice. We owe a special thanks to these early users:

- Ashok Kumar, Bangalore, India, who continued to use the method for sustainability assessments in Tumkur District, Karnataka State, India;
- Alejandro Imbach, Natalia Ortiz, IUCN M&E Facilitators Latin America, Claudia Bourancle, ProNaturaleza, Peru, and Claudia Paniagua, Mayra Gallo and Tania Ammour CATIE, Costa Rica, who have continued to use, adapt and further develop the methodology in their work in Latin America;
- Misael Kokwe, Emmanual Guveya, Freddie Kachote and Nyambe Nyambe, IUCN ROSA, who have adapted the method for use in assessing biodiversity in Southern Africa and for reporting on progress towards the goals of the Convention on Biological Diversity (CBD);
- Martha Rojas Chouchena and Caroline Martinet, IUCN Biodiversity Programme, who adopted the approach for IUCN's work on Articles 6, 7 and 26 of the CBD on the topic of indicators, assessment and national reporting, and in the SDC project;
- Khizer Farooq Omer, Sajidin Hussain and Fawad Khan in the IUCN Pakistan Programme who have adapted the approach to develop a monitoring framework for the Northern Areas Conservation Strategy in northern Pakistan;
- Aban Marker Kabraji, Andrew Ingles and Imtiaz Alvi, IUCN Asia Regional Programme, who continue to promote the use and adaptation of the approach in various programmes in Asia;
- Bill Found, York University, Canada, who picked up aspects of the method and approach while a member of the External Review Team for the IDRC supported project. He has since contributed useful ideas for refinement through the use of the approach in his work in Central America and in his teaching at York University;
- Tom Meridith, Faculty of Geography, McGill University, Canada, who adopted parts of the early methodology in his international work in Kenya and Central America and has waited patiently for this Resource Kit for several years.

The need for this Resource Kit has been evident for some time. While the ideas, concepts, methods and tools for sustainability assessment have spread far and wide – the provision of supporting materials for the method has lagged behind.

We are extremely grateful to Irene Guijt and Alex Moiseev who agreed to fill this gap – they compiled and wrote this Resource Kit with substantive inputs from Robert Prescott-Allen and Alejandro Imbach. We are grateful for their patience in collecting material from the eight-year span of the development of the methodology, for patiently pursuing a detailed understanding of the methodology and for searching for innovative ways of providing users with helpful suggestions for facilitating and training in sustainability assessment. The Kit has benefited considerably from Irene Guijt's extensive experience in facilitating and training. Through all of this Alex Moiseev has become a knowledgeable trainer in sustainability assessment and continues to support this work in various IUCN field sites.

Before the final version of the Resource Kit was completed, valuable critical review comments were provided by: Sam Chimbuya, Bill Found, Alejandro Imbach, Misael Kokwe, Ashok Kumar, Khizer Farooq Omer, Angela Walkley, and Jim Woodhill.

The Resource Kit was ably edited by Peter Hulm who, as a result of editing the final version of the Kit, knows more about sustainability assessment than he ever imagined he would.

It has been both a privilege and pleasure to have initiated and managed the early sustainability assessment work in IUCN, to have seen it develop and spread into practice over the past eight years, and perhaps most importantly to have worked with such fine, committed professionals.

Nancy MacPherson
Coordinator
IUCN M&E Initiative

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Overview of IUCN's Sustainability Assessment Method

Introduction

Although the goal of sustainable development is now almost universally accepted, people know little about what it entails or how to achieve it. What is a desirable state of human development? What makes for a resilient and supportive ecosystem? What combination of human and ecosystem wellbeing would be equitable and sustainable?

Assessments provide a means of learning from experience so that people can begin to answer these questions and design better policies and interventions. Sustainability Assessment, in turn, is a method for reflecting on and measuring sustainable development.

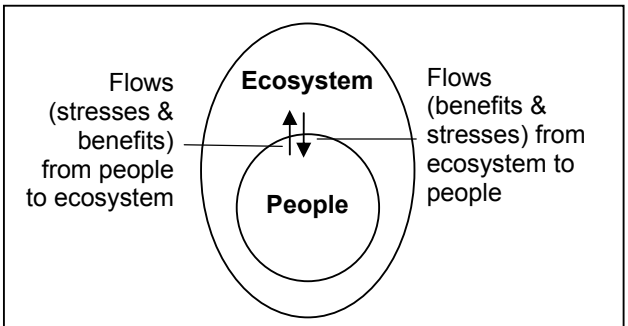
The IUCN Sustainability Assessment Method uses narrative and mapping as well as measurement to establish the context and communicate spatial indicators for the information it uses. It combines the indicators into a scaled chart known as the Barometer of Sustainability that enables human and ecosystem wellbeing to be compared at whatever level has been chosen for the Sustainability Assessment.

Developed over a seven-year period, the IUCN method continues to evolve with every use. This section describes what a Sustainability Assessment looks like, gives technical guidance on how to use the steps and tools in the method, and explains how Sustainability Assessment can be useful.

Part A contains technical and theoretical information. Part B expanding on key topics: how to train others in Sustainability Assessment and how to carry out the process, with examples.

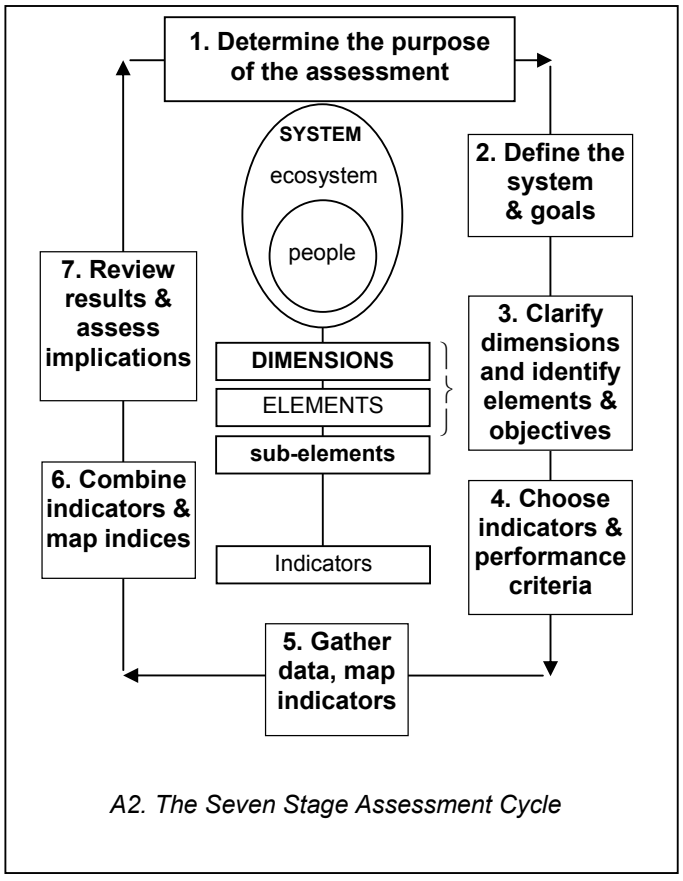
About IUCN's Method of Sustainability Assessment

IUCN's Sustainability Assessment Method is a structured analytical process for assessing progress toward sustainability. It integrates people's wellbeing and ecosystem wellbeing in a unique manner by assessing them together. The method guides people through the development of their context-specific vision of sustainability and of the means to measure changes towards realizing that vision. The IUCN Sustainability Assessment Method values both the process of developing the vision, its sub-components and indicators, as well as the data results themselves. Together they can help provide more comprehensive understanding of what sustainable development means in the area being assessed, while informing priority setting and decision-making by measuring current status in relation to the ideal.



A1. Why IUCN's method gives equal treatment to people and ecosystems

In contrast to other approaches, the IUCN method of Sustainability Assessment gives equal treatment to people and the ecosystem. It involves stakeholders in determining for themselves what sustainability means in their context. It uses as its framework a hierarchy of elements and objectives to translate the concept of sustainable development into concrete targets and measurable indicators, and thus making clear to all those involved what features everyone agrees contribute to measuring sustainability. The elements are designed to be tailored to local conditions and needs. The IUCN Sustainability Assessment Method is a user-focused process and thus can be used at international, regional, national, district or local scales.



A2. The Seven Stage Assessment Cycle

A Sustainability Assessment according to the method developed in IUCN combines a reflective process and measurement (data handling). Reflection on sustainability allows individuals or groups to think about their contexts in a structured environment, prompting them to consider difficult issues, look for patterns and make judgements. Reflection is useful on its own, but can be much more useful when combined with measurement – or data-handling, as it is often called – the process of identifying performance indicators, collecting data and combining results to obtain an overall picture of specific themes or sustainable development as a whole.

The assessment method set out in this Resource Kit uses scales of relative performance for the chosen indicators. This provides a common unit to show aggregate performance and overall human and ecological wellbeing. All this information, running from individual indicators to aggregated indices, can be used to support an assessment of performance and identification of priorities for action.

The method can be adapted for use at any level, from global to local – as the people involved define what the 'system' is on which they wish to concentrate the assessment. The IUCN Sustainability Assessment Method is intended to support decision-making by encouraging users to consider very consciously a broad range of issues tackling equally socio-economic concerns and ecological questions. For example, the method could be used as the basis for reporting on international conventions, environmental education or municipal decision-making, or simply to establish a baseline for tracking impacts.

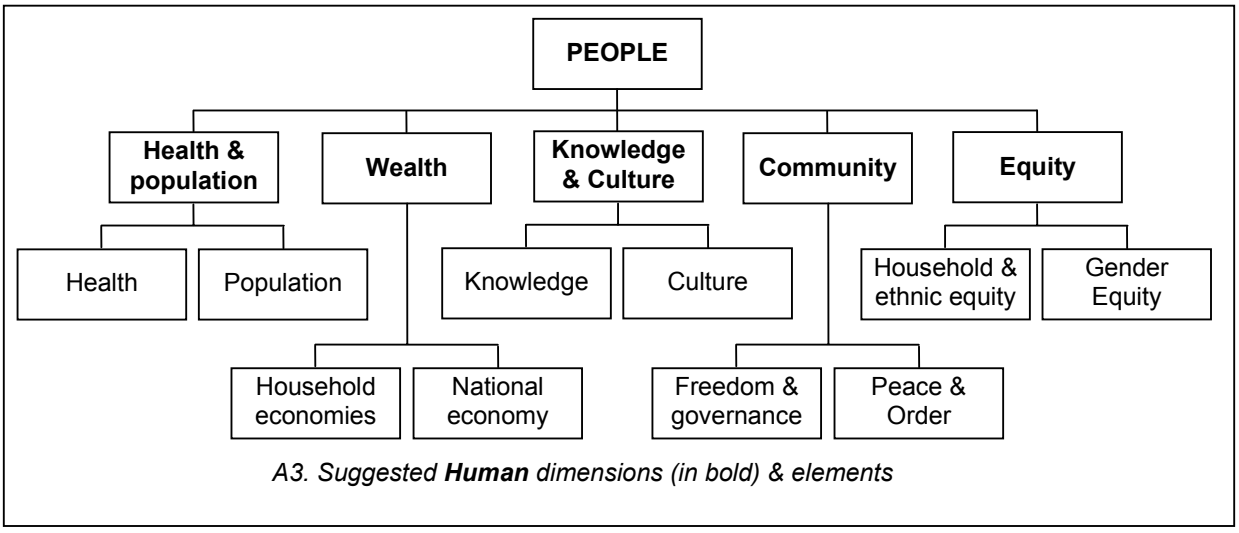
The full process can take up to two years, but many shorter variants can be developed by participants.

The Seven Stage Cycle

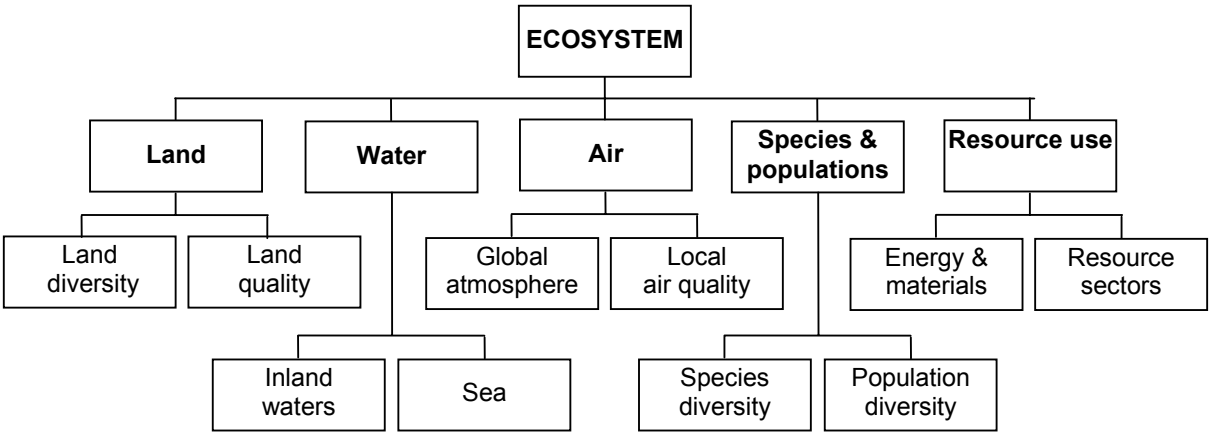
The IUCN Sustainability Assessment Method, in its full version, describes a process with seven stages (see A2). It is presented as a cycle because the assessment process is designed to allow updates that can show changes over time.

The first four stages of the cycle are designed to help users *express a shared vision of sustainability*, which is defined in increasingly specific ways, using dimensions (categories) and related elements (plus their objectives), indicators and performance criteria (see respectively A3, A4 and A15 on page 18). These stages aim to express the broadly defined vision as measurable indicators, thus moving participants from a general discussion to specific units that can be analysed more easily.

The last three stages help users *to assess overall human and ecological wellbeing* from the indicators, combining them and reviewing the indices.



*A3. Suggested **Human** dimensions (in bold) & elements*



*A4. Suggested **Ecosystem** dimensions (in bold) & elements*

Elements are key concerns or features of human society and the ecosystem that must be considered to get an adequate sense of their condition. They are grouped under *dimensions*. *Objectives* break the identified system goal(s) into specific parts that relate to each element.

The review stage links the assessment to action by analysing the performance patterns and the data behind them to suggest what actions are needed and where. The review can also provide the diagnosis for the design of programmes and projects.

A core strength of the IUCN Sustainability Assessment Method is the selection of indicators only after specifying goals, (sub)elements and objectives. This helps provide a stronger and more comprehensive framework with which relevant indicators can be chosen. By comparison, most other assessment approaches (see page 14 and Section B4) jump straight to indicator identification via informal methods like brainstorming and canvassing, thus bypassing Stages 1 and 2. This usually produces an unwieldy list of indicators, which then has to be reduced to a manageable number. Therefore the first stages play a crucial role in this approach to Sustainability Assessment.

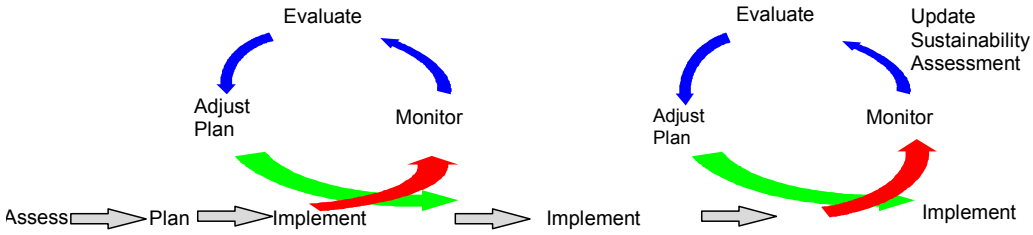
Using the IUCN Sustainability Assessment Method

A Sustainability Assessment can provide a solid information base that can serve a number of purposes. Assessments provide information that is an input to other processes; it is up to the users to determine how the results will be used and how they will need to be refined and positioned to serve other needs.

The main uses of Sustainability Assessment are:

- as an input to strategic planning, decision-making, project and programme design for international and non-governmental organizations and/or their government partners;
- as a source of information for monitoring, evaluation and impact analysis;
- as a source of information for reporting on international conventions, state of the environment reporting and on specific themes; and

- as a process to raise awareness about sustainable development issues.



A5. The Action-Reflection Cycle

Sustainability Assessment can be a complement to regular planning, monitoring, evaluation or reporting cycles (A5). It can help to structure the information needed for informed decisions and provide a method by which stakeholders may be engaged in collecting and interpreting that information. Sustainability Assessment is usually wider in scope, both with regard to space and time, than many projects. This offers the advantage of recording long-term changes in a system that may only be observed well after a project has ended.

Sustainability Assessment can be useful when there are particular needs for data on current state or trends or for the visual analyses offered by the method. Similarly, organizations may have needs for which the reflective assessment process could be helpful. It is most likely that organizations interested in assessment will have data and process-related needs (see A6).

A6. Data and Process Needs to which Sustainability Assessment can Respond

Data Needs	Process Needs
• To improve reporting to international conventions • To measure a baseline situation or collect data for outcome or impact analysis • To identify critical action gaps • To identify critical data gaps • To identify geographic areas within the assessment area that lag in terms of sustainable development, and therefore merit more targeted efforts • To help lay the basis of a comprehensive monitoring system	• To clarify and provide more solid rationale for programme/project action priorities, particularly if the organization(s) in question have traditionally focused primarily on either the conservation or poverty sides of sustainable development • To raise awareness on how human development and environmental protection inform one another • To gain organizational consensus about the focus of development interventions • To stimulate critical debate on a broad vision for sustainable development and how to assess this To enhance local ownership of a programme, project or policy intervention

The level of the assessment will depend on the people involved and the needs that have produced an interest in Sustainability Assessment. The assessment process described in this Kit has been carried out at sub-national and supra-national regional levels and at the global level. The lowest level is generally the district or municipality, although lower-level assessments have been carried out with this approach (see Section B5). Some

degree of administrative infrastructure is required to link assessment to decision-making, to ensure assessments are conducted regularly, and house a database of results. In other words, there is no upper limit for a Sustainability Assessment but there is a practical lower limit. Village authorities are too small-scale, except as part of a larger district assessment. More appropriate assessment methods exist for the lowest level.

No matter which question or level is driving the assessment process, the core activities (see the Seven-Stage Cycle, page 3 in this Overview) will involve the following in some form:

- stock-taking about the current situation;
- a comparison of spatial units (for example, comparing countries in a regional assessment or comparing wards in a district-level assessment);
- and, if repeated over time, a comparison of changes.

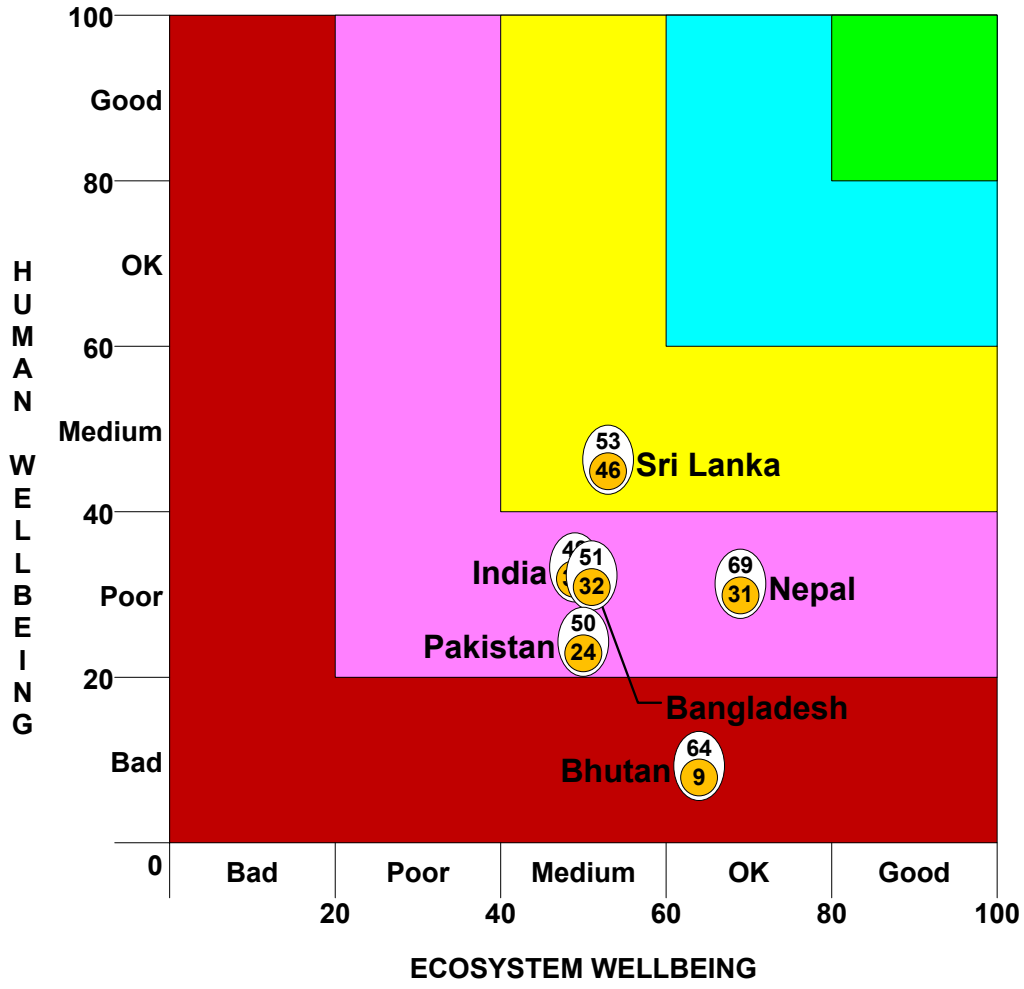
Each level will relate to different combinations of stakeholders, different data requirements and data availability. Each has different implications for required time and funding. As a result, the exact process by which these core activities are undertaken will vary (see also Sections B13, B14 and B15). Variations will also occur when the emphasis falls more on 'process' or on data-management. These variations inevitably lead to different outcomes from the Sustainability Assessments. Awareness of these variations is critical for organizations interested in the method when choosing if and how to use the assessment process and its component parts.

Thinking about the possible outputs for each stage can help in choosing whether and to what degree of intensity organizations should follow each assessment stage (see A7).

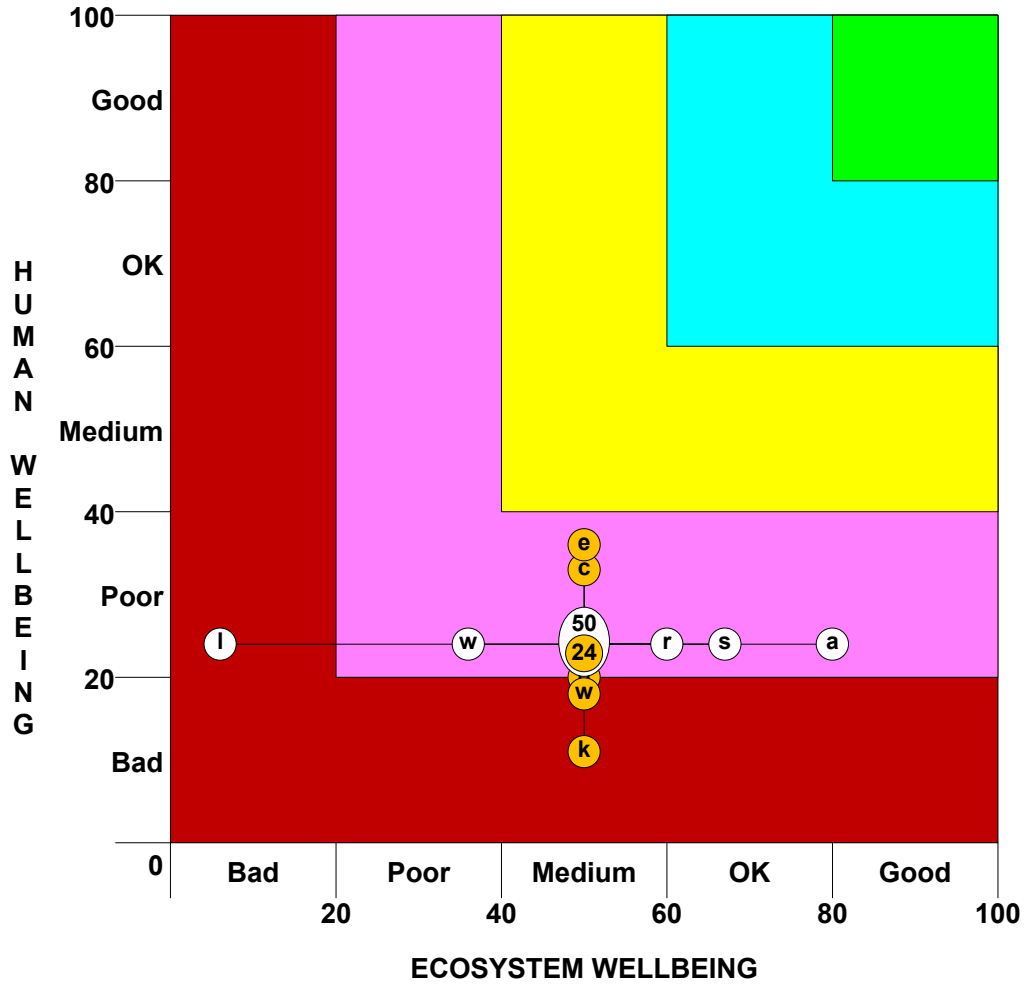
A7. List of Outputs per Stage in terms of Process and Data

	Process Outputs	*Data Outputs*
Stage 1. Determine the purpose of the assessment	• Agreement to undertake the assessment and enthusiasm and commitment from stakeholders (time and other resources) • Clarity amongst stakeholders about the expectations regarding the assessment, its main purpose and scope • Clear agreements on roles of stakeholders in the process • More interaction amongst stakeholders who may have worked in isolation • Deeper understanding about abstract notions like sustainability, development, participation	None
Stage 2. Define the system and goals	• Agreement on the exact scope of the assessment, enhanced familiarity with the assessment area • More understanding about divergence and agreement on what sustainable development means. Perspectives more inclusive of both human wellbeing and ecosystem wellbeing • Goals that form a common reference point for the	• Base maps of the system being assessed

	stakeholders and the area being assessed and can trigger activities	
Stage 3: Clarify dimensions, Identify elements and objectives	• More integrated appreciation of the need to think through both aspects of sustainable development • Agreement on what locally relevant elements are within the local vision of sustainable development and will be considered specifically as part of the assessment	• A meta-database, with sources of data identified (statistical, reported, mapped) • Data gaps identified
Stage 4: Choose indicators and performance criteria	• Deeper understanding of the complexity of assessing progress towards sustainability • Appreciation of the role and limitations of numbers • More detailed definition of what is considered acceptable performance for the indicators • More awareness of the wide variety of ways in which change can be assessed • Appreciation for the significance of certain kinds of data • Skills built in working with performance indicators	• List of indicators for all elements and sub-elements. • Performance criteria and scales for each indicator.
Stage 5: Gather data and map indicators	• Appreciation of the consequences of data gaps • Agreement on initial assessment of performance against indicators	• Database • Scores for indicators • Mapped performance of indicators
Stage 6: Combine indicators and map indices	• A growing understanding of overall performance of the system being assessed • Critical appreciation of the contribution and limitations of quantitative indices	• List of performance indices for the hierarchy • Visual representations of performance
Stage 7: Review results and assess implications	• Greater contact between stakeholders who previously worked in isolation • Agreement about priority actions for improving performance towards sustainable development • Appreciation of overall contribution of assessment process to quest for sustainable development • Motivation to fill data gaps plus clarity about where critical gaps lie	• An analysis (report) of patterns of performance • An analysis (report) of priorities for action • An analysis of each major theme (dimension) in the assessment



A8. The Barometer of Sustainability: a regional comparison (data for illustrative purposes only, not necessarily accurate or the most up-to-date). The scores for human wellbeing appear as the 'yoke', the ecosystem wellbeing scores appear as the 'egg-white' in the Egg of Wellbeing for each country.

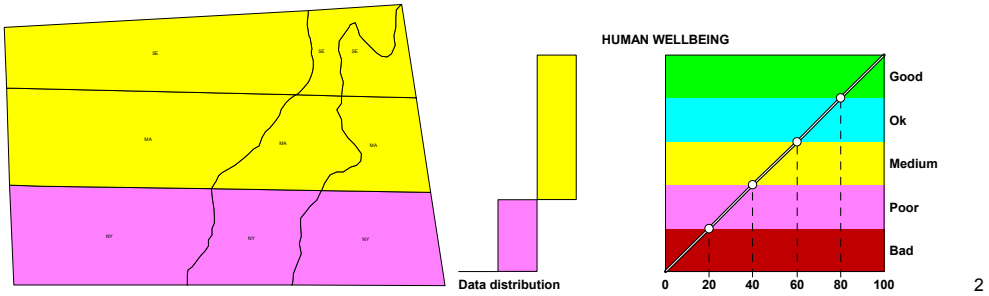


A9. The Barometer of Sustainability: a national perspective (data for illustrative purposes only: not necessarily accurate or the most up-to-date). The horizontal indices relate to the five suggested dimensions of ecosystem wellbeing, from left to right as they appear on the chart: land(l), water(w),resource use (r), species and populations (s), and air (a). The vertical indicators relate to the five dimensions suggested for the human wellbeing indices, from the bottom up as they appear on the chart: knowledge and culture(k), wealth (w), health (h) which is hidden behind wealth in this chart, community (c), and equity (e). Stage 4 of the IUCN Sustainability Assessment Method relates to choice of indicators while Stage 5 deals with their aggregation and mapping.

A10. Human Wellbeing indices for three villages in Zimuto, Zimbabwe[1]

Village	Village ID	Human Wellbeing Index
Sedeya	SE	38
Mangisai	MA	42
Nyevera	NY	44

A11. Human wellbeing map for Sedeya (top), Mangisai (middle)and Nyevera (bottom) villages, Zimuto, Zimbabwe



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Note: The communities did not want to identify or discuss the divisive issue of village boundaries. The boundaries on the maps are arbitrary lines drawn by the core team to allow differences in performance to be displayed across a zone. They do not represent any judgement or opinion as to where the boundaries may be.

Development of IUCN's Method of Sustainability Assessment

In 1993 IUCN formed a team to develop principles and tools for assessing sustainable development. The work was a natural offshoot from IUCN's work on National Conservation Strategies. With these strategies largely developed and some already being implemented, there was a need for a user-driven approach to ascertain the changes that were resulting. Much of the work being carried out at the time was indicator-driven, and there was a global push toward developing universally applicable sets of indicators of sustainability. However, IUCN's partners wanted tools and methods that could be adapted to local contexts and produce results that were locally meaningful. National Conservation Strategies as drawn up manifested great variance in approach. They showed that sustainability is often a negotiated concept, one, which defies universal interpretation (i.e. through standardized measures).

The International Assessment Team, comprising practitioners from all of IUCN's major regions, initially set out to develop a set of principles that would guide the assessment of sustainable development in field testing. The intention was that three different teams in three different regions would use the principles to develop methods and tools

[1] From: Emmanuel Guveya, Freddie Kachote, Misael Kokwe and Robert Prescott-Allen. 1999. A System Assessment in Zimuto Communal Lands, Zimbabwe. With additional comments from Misael Kokwe. See Part B Section 7.

[2] ibid.

appropriate to their circumstances and needs. The teams would then meet to share experiences before the final set of tools were reviewed and published.

The principles[3] developed by the International Assessment Team (already summarized in 'About the IUCN Resource Kit on Sustainability Assessment') included:

- *Wholeness*. People are an inextricable part of the ecosystem: people and the ecosystem need to be treated together as equally important. Interactions among people, and between people and the environment, are complex and poorly understood. *Thus we need to start by…*
- *Asking Questions.* We must recognize our ignorance, and ask questions. We cannot assess anything unless we know which questions to ask. To be useful – to help make progress – questions need a context. *Therefore we need…*
- *Reflective Institutions.* The context for the questioning approach is institutional: groups of people coming together to question and learn collectively. *The process of reflection will, we suggest, lead inevitably to an approach that is…*
- *People-focused.* People, even if they cause the problem, must be our source of a solution, though those who cause the problem may not be those who have to find the solution. In any event, our principal arena for action lies in influencing the motivation for human behaviour.

The national-level assessment teams used these basic principles to develop their own approaches to evaluating sustainability that would suit local needs. The experiences yielded many of the tools and processes that are important components in the IUCN Sustainability Assessment Method. In the Tumkur District of India, community-level assessment work supported a proposal to the national-level Integrated Mission on Sustainable Development (IMSD). In Zimbabwe, IUCN provided technical advice to the UNDP-supported District Environmental Action Planning project in eight rural Districts. The Egg of Wellbeing was used with considerable success here.

The experience in Zimbabwe also led to the development of the Barometer of Sustainability and a cyclical process for assessment and planning. However, the cycles in Zimbabwe each involved 40 steps!

In Colombia, village-level planning was supported by the work of the NGO Fundación pro Sierra Nevada de Santa Marta. The Colombian experience contributed the concepts of indicators, spatial levels and reflection.

The case studies in Dasudi, India, Zimuto, Zimbabwe and Real Estero, Nicaragua (in Section B7) will give readers a more in-depth understanding of recent experiences.

These and other experiences eventually led IUCN to reflect on how to relate Sustainability Assessment work to the organization's needs. In general terms, the ability to measure sustainability in any given area over a period of time needed to be linked to what the organization was doing at the time. The national experience from Colombia also demonstrated that a sound ability to assess change within an organization is also

[3] An Approach to Assessing Progress Toward Sustainability: Tools and Training Series Overview, IV

essential for solid work on sustainable development. The everyday experience of IUCN required that assessment work be linked, in some manner, to project and programme cycles.

Sustainability Assessment has been used within IUCN to support some of IUCN's programming needs. In Zimbabwe and Zambia, local-level assessments were undertaken to assist in the evaluation of biodiversity resources of the region. In Pakistan, training was offered to assist Provincial Conservation Strategy teams do a better job of assessing priorities. In India, IUCN partners have used local assessments as a negotiating tool with government planners. Two programmes at the global level are using the assessment framework to develop thematic analyses: around forest conservation and biodiversity policy. In all cases, the approach has made users consider a more complete range of issues, particularly those related to human development.

Sustainability Assessment is an evolving approach. How it is used and applied changes as more users attempt their own assessments. The team at IUCN has worked with users since the start to learn more about how assessment can be done, and how the results can be used.

The IUCN Method of Sustainability Assessment was developed through active experimentation with users in the field. Initially, the 'Assessing Progress to Sustainability' project of IUCN/IDRC developed a set of principles, methods and tools for use in the field. Through testing, reflection and revision, the method of Sustainability Assessment as described in this Resource Kit evolved to its present form.

The IUCN team learned two main lessons from testing early versions of the Sustainability Assessment Method. Above all, the method must be adaptable and adapted to each application. In all the field tests, the team always encountered unique conditions, stakeholder groups and interests. Capacity, resources and data availability also varied greatly. However, the core message of the method was always embraced and local ingenuity almost always took over.

The Sustainability Assessment Method has always been used as an input to other processes, as these processes are already in place before any work on Sustainability Assessment starts. Some examples of these processes are: state of the environment reporting, development of provincial conservation strategies, awareness raising and thematic reporting.

Below are listed a range of past, current and planned applications. They illustrate the methods flexibility and integration principles that emerged clearly from the early pilot stages. This section is intended to provide some context to the case studies that follow in Sections B5, B6 and B7.

Asia

India: The team from the NGO Development Alternatives recently completed a second cycle of Sustainability Assessments in Dasudi District as a follow-up to earlier work undertaken in Tumkur District (Kumar 1999). Development Alternatives was the original country-level partner in developing the method in India. The team contributed a number of tools on community negotiation, mapping and indicators before using the current Sustainability Assessment Method for Tumkur District and then Dasudi.

The ***Dasudi*** case study (B5) documents the process by which Development Alternatives led the assessment process. The Dasudi assessment went through the entire assessment cycle in a relatively small geographic area.

Pakistan: As part of IUCN's Monitoring and Evaluation Initiative, three teams received training in Sustainability Assessment. Two teams, one in Balochistan and one in the Northern Areas intended to use the method to assist in the development of Provincial Conservation Strategies. It was hoped that the assessment results would help sharpen the strategy and identify priority areas for action. In both cases, negotiations are still under way on developing the assessments further. The Northern Areas team has recently indicated that it will use Sustainability Assessment as the basis for its monitoring plan of the Northern Areas Conservation Strategy. A third team, working in two provinces of Pakistan on an integrated natural resources project used the training to develop better awareness in field activities about the links between human development and conservation. All of the training was offered to teams working in IUCN's Pakistan Country Office. In an organization such as IUCN, it is important to strengthen capacity to appreciate and account for human development issues, in addition to its traditional focus on conservation.

Himalayas Region: IUCN is currently negotiating with ICIMOD, a regional research centre, to develop a comprehensive application of the Sustainability Assessment Method for countries of the region.

Africa

Zimbabwe/Zambia: The Ecosystems Programme of IUCN's Regional Office for Southern Africa completed two assessments to support ongoing work in watershed management. Working with local stakeholders in Mongu (Zambia) and Zimuto (Zimbabwe), it aimed to demonstrate how biodiversity conservation could be combined with watershed conservation and human development.

The teams made several significant contributions to the IUCN Sustainability Assessment Method. For instance, the team concluded that community-level assessments cannot be expected to collect certain types of information, such as locally relevant data on biodiversity conservation, because species data is collected over much larger areas.

The team at IUCN's Regional Office for Southern Africa has recently started planning for a new round of assessments in Zimbabwe, Zambia and Mozambique. This work is an extension of the previous effort but will include more focused activities to assess biodiversity.

The ***Zimuto*** case study (B6) documents the assessment process in Zimbabwe.

West Africa Region: IUCN's Office for West Africa (BRAO) is in the process of developing an assessment process with the United Nations Environment Programme that will produce a State of the Environment Report and inputs both to regional policy-making processes and to the Global Environment Outlook report series. The partnership seeks to build upon UNEP's existing network for environmental assessment, by including a wide range of actors in the region. The assessment is intended to increase capacity to

link human development and environmental issues and address the human causes of environmental change.

The assessment will cover 17 countries in the region, and will aim to use regional expertise to develop the assessment, rather than engage in widespread stakeholder consultation. The team in West Africa felt that due to the size of the geographic area, it would be prohibitively expensive to undertake an assessment with wide stakeholder consultation and sustainability issues in West Africa have been fairly well documented at the regional level.

Latin America

Through IUCN's Regional Office for Mesoamerica, Sustainability Assessment activities were undertaken in a variety of countries over the past eight years. In Colombia, the Fundación pro Sierra Nevada de Santa Marta partnered with IUCN to help develop the first generation of assessment tools. Through this work and other work in Peru (with ProNaturaleza and other members of IUCN), Colombia (Colombian Ministry of Health), Nicaragua (CATIE and the Ologo Mangroves Project) and Central America (ALIDES project) a number of different tools based on the principles of assessment were tested and developed. From this work, the important concepts of spatial hierarchies, reflection in sustainability and mapping were integrated into Sustainability Assessment. The work in Latin America has been highly experimental, both through development of new tools, and by new applications of those tools at a variety of spatial levels.

The ***Estero Real*** case study in Nicaragua (B7) is a good example of how Sustainability Assessment has been applied in Latin America. The process used an abbreviated assessment cycle that did not give so much importance to data. Instead it focused on the questioning and reflection process of the method to deal with difficult local-sustainability issues.

How IUCN's Sustainability Assessment Method Relates to Other Approaches

IUCN is but one of many organizations working on tools, methods and indicators for measuring sustainability. Practitioners range from small community groups trying to build healthier communities to UN agencies aiming to develop universally applicable core sets of indicators. Globally, these groups collaborate regularly, Sustainability Assessment has benefited from this interaction. Many of the key features of the method has its roots in the practice of others, but have been brought together in a unique manner.

The IUCN Sustainability Assessment Method measures both human and ecosystem wellbeing and gives them equal importance. Other approaches do things differently. Many separate out social and economic spheres when talking about human development. Some approaches measure only environmental attributes. There are many different combinations. The IUCN Method of Sustainability Assessment is unique in insisting that human and ecosystem wellbeing be considered on an equal basis.

There are also many was of measuring sustainability. Some practitioners maintain that sustainable development can be measured through a core set of universally applicable

indicators. Others are seeking to develop a highly aggregated index of sustainability similar to the economic measure of Gross National Product. Underpinning many initiatives are complex accounting systems – covering resources, pollution or the economy – from which indicators are derived. In all of these cases, the process is often vitiated by hidden assumptions, and proves unacceptable to local communities and other stakeholders. IUCN set out to develop a system that anyone could understand, in which stakeholders' assumptions would be transparent and the method adaptable to local circumstances. Use of the IUCN Method of Sustainability Assessment does not preclude the use of other approaches – most current method of measuring sustainability can be incorporated quite easily into this framework.

Section B4 compares the IUCN Sustainability Assessment Method with other approaches in more detail.

A12. IUCN's Sustainability Assessment Method and Other Approaches

Typical approaches to sustainability assessment include:

- the OECD's Environmental Indicators, a collection that produces standard state of environment reporting on the basis of a dozen ecosystem indicators
- the International Monetary Fund's General Data Dissemination Standard, which represents mainly economic reporting, with four economic sectors and one socio-demographic
- a binary systemic approach with people and ecosystem indicators, as used by Wellbeing Assessment, United Nations Environment Programme's Global Environmental Outlook, and others
- the three-spheres (economy/society/environment) approach used by the World Bank and others
- the four-part (economy/society/institutions/environment) framework of the United Nations Commission on Sustainable Development for reporting in Agenda 21

Only the last three approaches pay significant attention to social issues. Only the systemic approach (number three in the list) gives equal weight to people and the ecosystem. See below for other features that differentiate the IUCN Method from similar approaches.

What the IUCN Assessment Method is Not…

The IUCN Sustainability Assessment Method is not a substitute for regular planning, monitoring, evaluation or reporting cycles. However, it can complement these processes by helping to structure the material and data needed for informed decisions and by providing a tool through which stakeholders may be engaged in collecting and interpreting that information.

Similarly, Sustainability Assessment cannot replace project planning and evaluation. A Sustainability Assessment differs from a project in two important ways – spatial scope and length in time – and while the information gathered may be useful for a project, the scales may not match. A project typically deals with part of an assessment area, while assessment decisions and data are collected for the entire spatial area. Similarly,

Sustainability Assessments may use indicators that require longer time-scales than the project's life. At best, Sustainability Assessment can measure changes in the spatial area – on human and ecosystem wellbeing – but ascribing those changes to project outcomes and impacts requires other tools and more analysis.

Similarly, Sustainability Assessment does not create better organizations. It can help decision-makers make more informed decisions. Ultimately, however, the will to change must come from individuals within the organization, and there are other ways to help facilitate that change.

Being aware of what Sustainability Assessment cannot provide will help ensure that expectations are kept close to what is possible. Sustainability Assessment provides a more complete information base. What is done with that information is ultimately up to the users.

Key Features of IUCN's Sustainability Assessment Method

Several key features make the process developed by IUCN a unique assessment method.

Technical Features

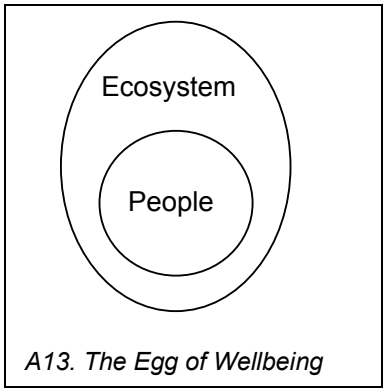
- Equal treatment of people and the ecosystem in themes that are quantified and combined, as both are essential for sustainable development in the long term.
- An analytical hierarchy that builds from a shared vision of sustainability to specific measurements via identification of elements and objectives in a comprehensive manner.
- Visual tools: the Barometer of Sustainability, the Egg of Wellbeing and maps are powerful visual and analytical tools to help users articulate and assess overall sustainability and specific areas of concern.
- Indicators that communicate performance and can be combined to show how each contributes to the performance of themes, and to the overall vision, as too often the communicative power of indicators is obscured by hidden assumptions and excessive complexity.

Process Features

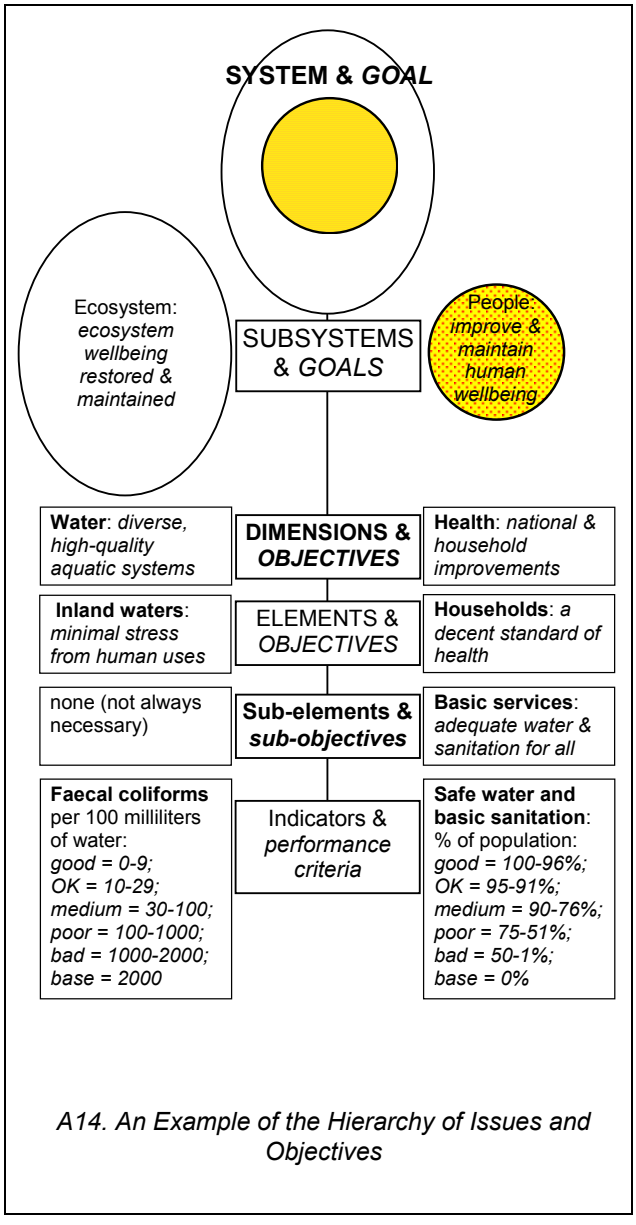
- A seven stage cycle of progressively detailed reflection, analysis, and judgement that helps ensure important elements are not missed and that measurements show overall sustainability as well as progress for key elements;
- Integrated use of narrative, measurements and mapping to record the process and results. This ensures that results are presented clearly, visually and with assumptions made explicit, thus facilitating discussion.
- A user-focused process that provides the tools and the guidance to help any group articulate and understand sustainable development in its own terms instead of adopting a standard set of disconnected indicators.
- Flexibility: the method can be applied to support a broad range of uses and can be scaled according to needs and resources without losing the central message or sacrificing key features.

Equal Treatment of People and the Ecosystem

The core principle of Sustainability Assessment as developed by IUCN is that sustainable development must be a combination of human wellbeing and ecosystem wellbeing. Human wellbeing is defined as a condition in which all members of society are able to determine and meet their needs and enjoy a range of choices to meet their potential. Ecosystem wellbeing is defined as a condition in which the ecosystem can maintain its diversity and quality, and thus its capacity to support people and the rest of life in addition to the potential to adapt to change and provide a wide range of choices and opportunities for the future.



A13. The Egg of Wellbeing



A14. An Example of the Hierarchy of Issues and Objectives

The two parts can be pictured as an egg, and the concept has been dubbed the Egg of Wellbeing (A13). People depend on the ecosystem, which surrounds and supports them much as the white of an egg surrounds and supports the yolk. At the same time, a healthy ecosystem is no compensation if people are victims of poverty, misery, violence or oppression. Just as an egg can be good only if both the yolk and white are good, so a society can be well and sustainable only if both people and the ecosystem are well.

Human wellbeing is inherent in the idea of sustainability, as it would be unimaginable to want to perpetuate a low standard of living. Ecosystem wellbeing is a requirement because the ecosystem that supports life and makes possible any standard of living. Trade-offs between the needs of people and the needs of the ecosystem will always exist but can be limited and short term, rather than permanent. Ultimately, human and ecosystem wellbeing

are equally important, and a sustainable society needs to achieve both together. Hence a logical goal for every society is *to improve and maintain the wellbeing of people and the ecosystem*.

A15. A Framework of Dimensions: Human Populations and Ecosystems

The IUCN Sustainability Assessment Method suggests a framework of five human and five ecosystem dimensions (see A16 and A17). The dimensions were chosen after development and testing in a variety of field sites, and are intended to provide a common starting point for all assessments. Within this framework, users select their own elements and indicators. The framework of dimensions is helpful to ensure that important elements are not missed in the assessment process.

The framework is designed to combine a wide range of elements into a few major groups of roughly equal importance. The dimensions of these groupings are comprehensive enough to accommodate the majority of concerns of most societies: any issue regarded as significant for wellbeing and sustainable development has a place in one of the dimensions. They represent non-technical and accessible concepts (wealth, water, etc.). Because they are equally important, they are easily combined into indices of human and ecosystem wellbeing. A common framework of dimensions allows assessments to be tailored to local conditions and needs and at the same time makes comparison with other Sustainability assessments easier.

A fairly comprehensive sample of possible elements in each dimension includes:

- *Health and population*: physical and mental health, disease, mortality, fertility, population growth.
- *Wealth*: the economy, income, material goods, infrastructure, basic needs for food, water, clothing and shelter.
- *Knowledge and culture*: education, state of knowledge about people and the ecosystem, communication, systems of belief and expression.
- *Community*: rights and freedoms, governance, institutions, peace, crime, civil order.
- *Equity*: distribution of benefits and burdens between males and females and among households, ethnic groups and other social divisions.
- *Land*: the diversity and quality of land ecosystems, including their modification, conversion, and degradation.
- *Water*: the diversity and quality of inland water and marine ecosystems; modification by dams, embankments, pollution, and water withdrawal.
- *Air*: local air quality and the global atmosphere.
- *Species and populations*: status of wild species and wild and domesticated (crop and livestock) populations.
- *Resource use*: energy and materials, waste generation and disposal, recycling; resource sectors such as agriculture, fisheries, timber, mining, and hunting.

The method permits users to choose their own dimensions, based on their knowledge of the geographic area under consideration. Sections B5, B6 and B7 contain examples of cases where the recommended set of dimensions were used, and also where a new set was chosen. There are advantages and disadvantages to either choice. The recommended set of dimensions emerged from much testing around the world and should be broad enough to include virtually any element in the framework. However, in some areas specific concerns tend to have critical importance over others while in other areas the process of defining critical dimensions may be essential for finding consensus on what, locally, constitutes sustainability. The IUCN Sustainability Assessment Method can accommodate such differences in dealing with dimensions.

Dimensions are clusters of similar elements. It is important to ensure that dimensions are as mutually exclusive as possible. Try to make sure that elements are not placed on two or more dimensions, since the double- or triple counting will skew the results. If you choose to create your own dimensions, identify elements as you would normally would, eliminating duplication and trying to relate them to the vision. Then, cluster them into categories, checking that elements are not double-counted. It is entirely possible that the clustering exercise will take several rounds to refine. Allocate enough time for this task.

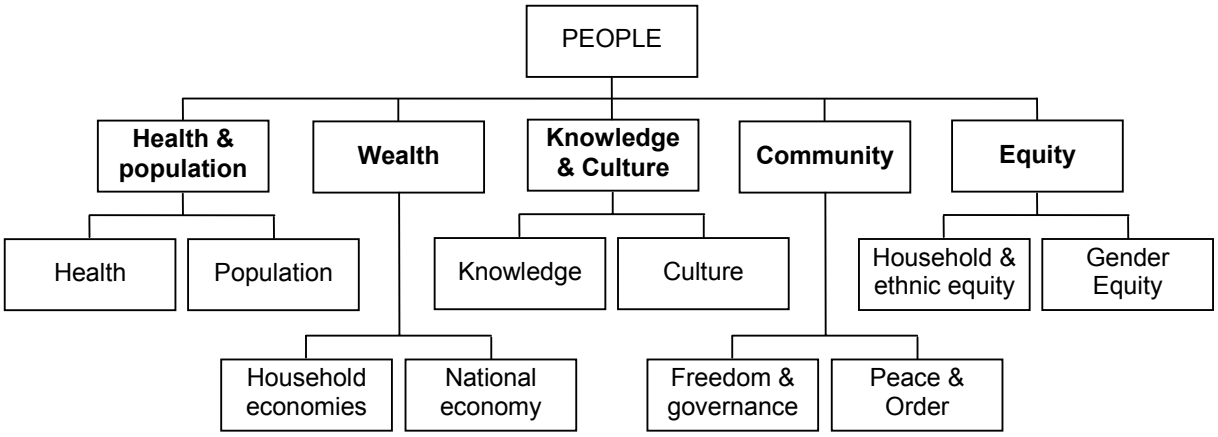
To assess human and ecosystem wellbeing equally, there should be an equal number of dimensions for each subsystem. We suggest using five dimensions for mathematical reasons. However, it is possible to use three to seven. But is vitally important to use an equal number of dimensions for each subsystem. Otherwise the weight given to particular dimensions may be diminished.

More guidance on this topic is offered in Stage 2 and Section B3.

For these reasons, the IUCN Method of Sustainability Assessment considers the wellbeing of people and the ecosystem together but measures them separately – and then brings them together again. Information is organized into two subsystems, or branches of the system (A14): people (human communities, economies and artefacts); and ecosystem (ecological communities, processes and resources).

As these two subsystems interact, the interactions between them, such as 'resource use', are placed within the subsystem where the impacts are felt. Accordingly, human stresses on the ecosystem (resource depletion, pollution, etc.) and benefits to the ecosystem (conservation) are recorded under 'ecosystem'; and ecosystem benefits to people (economic resources, health, etc.) and stresses on people (natural disasters, etc.) are recorded under 'people' (see Stage 3 for more on this issue).

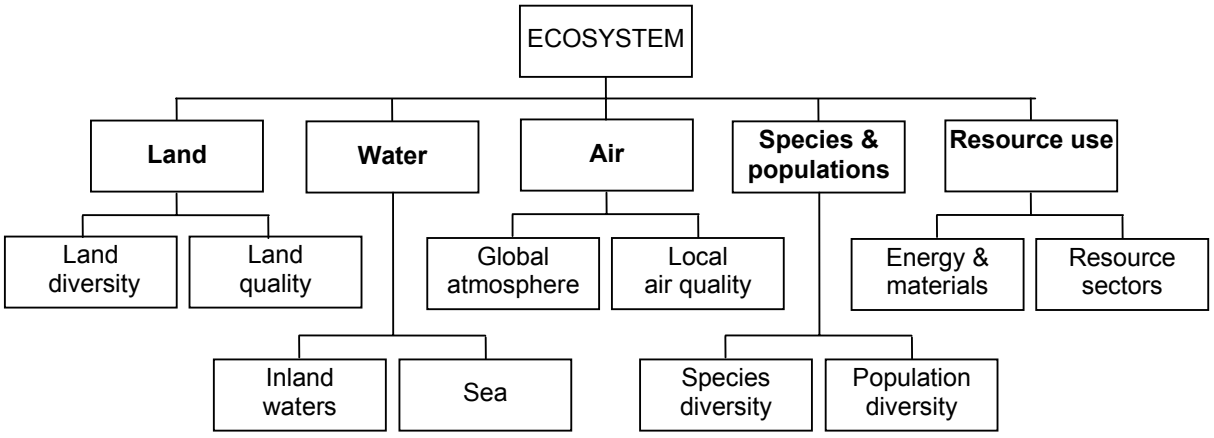
The division of people and ecosystem into two equal branches of reflection, measurement, and analysis allows for comparison between progress in human development and ecosystem conservation. It is not possible to measure sustainability *per se* as we simply do not know what combinations of human and ecosystem wellbeing would be sustainable. However, most societies would consider themselves more likely to be sustainable if their human wellbeing and ecosystem wellbeing are both high, i.e. when ecosystem stress (the opposite of ecosystem wellbeing) is low. Progress toward sustainability can therefore be shown by the ratio of human wellbeing to ecosystem stress (see Stage 7).



*A16 (A3). Human Dimensions (in **bold**) and Elements*

An Analytical Hierarchy – from Big Picture to Details

It is not possible to measure progress toward sustainability directly. IUCN's Sustainability Assessment Method – like any other assessment method – measures sustainability by assessing individual indicators but then, critically, aggregating them. In this method, the indicators, which are measurable by definition, are used to assess elements such as health or culture, which in turn make up the larger dimensions of health and population or knowledge and culture. Five suggested human and five ecosystem dimensions are used to organize elements by theme (see A15). The hierarchy allows users to see



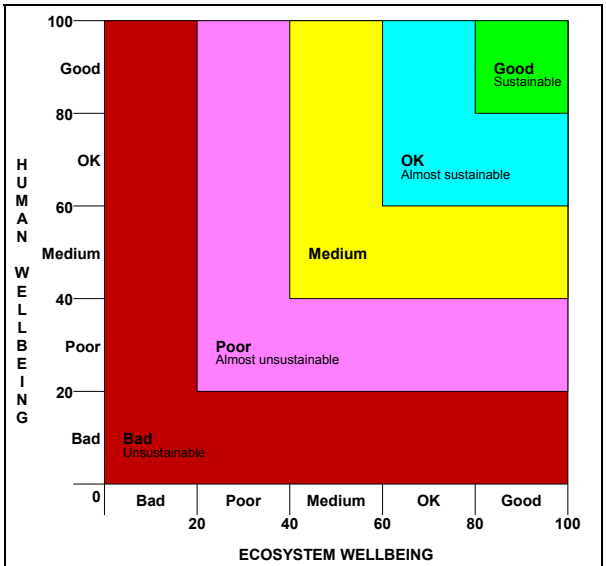
*A17 (A4). Ecosystem Dimensions (in **bold**) and Elements*

simultaneously the detailed performance (indicators), while affording an appreciation of the big picture (wellbeing of people and the ecosystem).

A hierarchy of objectives (A16 and A17) provides a matching series of stepping stones down from the overall goal to specific performance criteria, helping users to translate the concept of sustainable development into concrete improvements in people's lives and the condition of an ecosystem.

Since it is impossible to account for everything, and no instrument exists for measuring wellbeing and sustainability directly, assessments measure representative aspects, or indicators. Indicators require the collection and analysis of, often, large amounts of data. This data can become a mess of numbers. The challenge, therefore, is to identify those features that reveal most about the state of the system, using the fewest possible number indicators.

In Sustainability Assessment, ensuring the message is not lost amidst the indicators is made possible by using the hierarchy, which starts with the system and its goal, and moves via increasingly specific elements and objectives to measurable indicators and performance criteria. The hierarchy of *elements* ensures that a manageable set of indicators reveals key aspects of human and ecosystem wellbeing in the system being assessed. Combined with analysis, it can help users of the assessment to understand how well the indicators represent key features of the system and their relationship to each other. The hierarchy of *objectives* helps users to focus the assessment on what needs to be undertaken to achieve sustainable development. It also provides a logical way of converting general concepts of sustainable development, wellbeing and progress into a set of explicit human and environmental conditions.



A18. The Barometer of Sustainability

Visual Tools: the Barometer of Sustainability, the Egg of Wellbeing, Maps

The Barometer of Sustainability[4] (A18) is a tool for combining human and ecosystem wellbeing visually in a chart of results, designed to provoke discussion and further analysis. It presents indices (compound indicators) visually, providing anyone – from villager to head of state – with an immediate picture of human and ecosystem wellbeing. It can display the main dimensions of each index to highlight the aspects of performance that need most attention. It can portray changes in the indices over time and compare the indices of different societies.

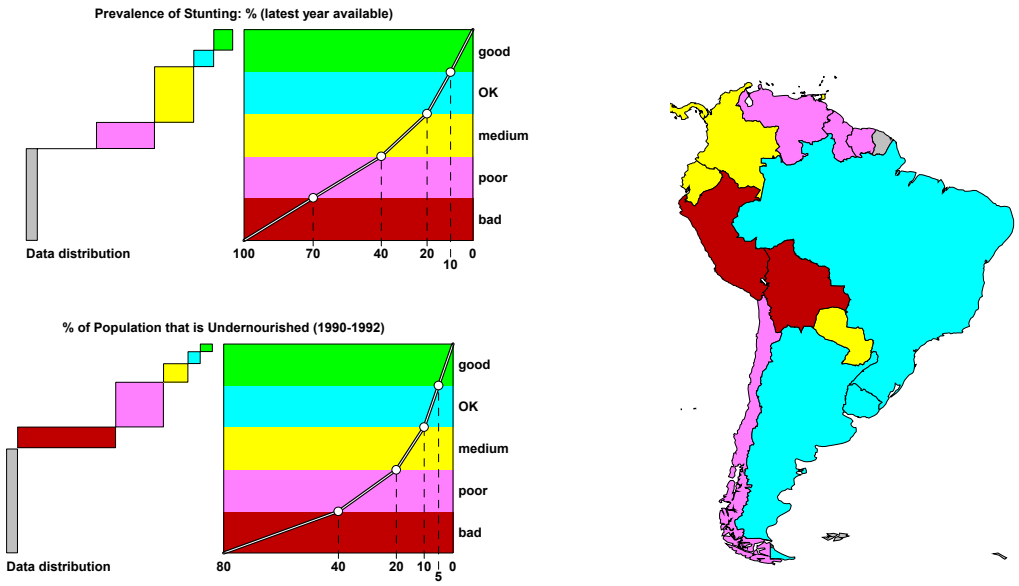
The Barometer of Sustainability is the only performance scale that measures human and ecosystem wellbeing together without submerging one in the other. The Barometer's key features are:

- Two axes, one for human wellbeing, the other for ecosystem wellbeing. This enables each set of indicators to be combined independently, keeping them separate to allow analysis of people-ecosystem interactions.
- The axis with the lower score overrides the other axis in the analysis. This prevents a high score for human wellbeing from offsetting a low score for ecosystem wellbeing, or vice versa. This approach reflects the view that people and the ecosystem are equally important and that sustainable development must improve and maintain the wellbeing of both.
- Each axis is divided into five bands. This allows users to define not just the end points of the scale – what is sustainable for them – but intermediate points as well, for greater clarity when using the scale.

The Barometer shows the scores of human wellbeing relative to ecosystem wellbeing on a graphic that immediately allows one to see the relative performance of different spatial units (such as countries) or how a single spatial unit (e.g. country or region) scores on different dimensions – such as land, water, air, resource use or biodiversity (see A9).

Mapping is another visual tool for showing sustainability. For each indicator and index – a map – showing performance can be generated (A19). Maps allow user to see what parts of the system are doing well or poorly and where actions should be concentrated.

[4] Robert Prescott-Allen, 2001



A19. Food Sufficiency in South America: Indicators and Map
Using maps and graphics, assessments can quickly become visual tools for communication. This map and graphic shows two combined indicators, the pattern of performance in South America, and the indicators themselves. The graphic of the individual indicators shows the performance scale and the distribution of scores in South America. It shows immediately how few children are well-nourished – and where the hot-spots of undernourishment are found.

Maps are the quickest way to summarize large amounts of information about sustainability. Combined with performance indicators that can be combined, a series of maps can show in show everything from the details of each indicator used in the assessment to visual interpretations of human and ecosystem wellbeing.

Indicators that Communicate Performance

Performance indicators are those indicators for which the range of good and bad performance has already been defined. These indicators can be easily interpreted because the key to their interpretation has already been provided. Sustainability Assessment uses these indicators because they are the simplest and most direct way of operationalizing a vision of sustainability and measuring progress toward that vision.

The Barometer is an effective way to combine indicators. Indicators can be combined in one of two ways: by converting their measurements to a common unit, such as money, or by putting them on a performance scale (see Section B4).

It should be noted, however, that standardized monetary units tend to distort the indicators because they lose or bury information. For example, it is impossible to convert life, freedom, or a wild species into dollars without losing most of what we value about them.

By contrast, a performance scale gives a score to an indicator measurement based on the distance between the measurement and a standard of performance. Performance criteria (definitions of a standard level performance) can differ with each indicator, but since their scores are scaled across the same qualitative range, the scores can be combined. The Barometer of Sustainability charts each indicator and each index in relation to others, based on how well they have performed according to the standards set for adequate performance.

The Seven Stage Cycle in Detail

Following the IUCN method, each Sustainability Assessment is carried out by a group of organizations and individuals, the 'participants,' following a cycle of seven stages:

- first, a discussion of the rationale for the assessment – its purposes, intended uses, users of the results, who will participate and how it will be carried out;
- then, moving from broad overview to the specifics of indicators, the next four stages: participants determine what and how the assessment will measure, and then carry out the measuring or collating of data;
- finally, switching from the specific indicators to an aggregated view of the bigger picture again, the last two stages: participants combine the measurements, analyse the results, and translate them into conclusions for action.

The stages are:

1. ***Determine the purpose of the Sustainability Assessment***. Determine how comprehensive to make the assessment, its purpose, its intended users and participants, its intended uses and methods. All this must be agreed and documented.
2. ***Define the system and goals***. The *system* consists of the people and ecosystem of the area to be assessed. The *goals* encapsulate a vision of sustainable development and provide the basis for deciding what the assessment will measure.
3. ***Clarify dimensions, identify elements and objectives***. System *dimensions* are clusters of themes – ten are proposed in this method (see A15), but users should confirm that these are appropriate to their needs and make adjustments if necessary. *Elements* are key concerns or features of human society and the ecosystem that must be considered to get an adequate sense of their condition. They are grouped under dimensions. *Objectives* break the identified system goal(s) into specific parts that relate to each element.
4. ***Choose indicators and performance criteria***. *Indicators* are measurable and representative aspects of an element. *Performance criteria* are the standards set to measure achievement under each indicator.
5. ***Gather data and map the indicators***. Indicator results are produced by gathering and compiling data, scored according to the performance criteria, and mapped.
6. ***Combine the indicators and map the indices***. Indicator scores are combined to move up the hierarchy: indicators into sub-element indices; sub-element indices into element indices; element indices into dimension indices; and dimension indices into subsystem indices (separate indices for people and the ecosystem). Indices are mapped to reveal visually overall findings and specific patterns of performance.
7. ***Review results and assess implications***. The review links the assessment to action by analysing the patterns and the data behind them to suggest what actions are needed and where. The review also provides the diagnosis for the design of programs and projects.

Only once the framework of goals, elements and objectives is adopted should indicators be chosen to represent the elements. By comparison, in most other assessment approaches, informal methods such as brainstorming and canvassing are used to identify indicators, without going through the first two stages. This usually produces an unwieldy list of indicators, which then has to be reduced to a manageable number (see A22 on page 29). For example, the city of Seattle's 'Sustainable Seattle' assessment started with 150 indicators, which eventually were reduced to 40 (Sustainable Seattle, 1995). If indicators are chosen in a conceptual vacuum, it is very difficult to know how important they are or how relevant to what people want to achieve. Therefore the first stages ('Determine the purpose' and 'Define the system and goals') play a crucial role in this approach to system assessment.

Narrative + Measurement + Mapping

An assessment procedure will reflect people's aspirations and influence their decisions only if it is open to wide participation and scrutiny by the decision-makers who are expected to act on it and by the people who are expected to live with the results. Therefore, the assessment method needs to be not only easy to use: the data must also be made available to everyone, and assumptions and judgements clearly set out. This will enable anyone to compare their own views and information against the basis for decisions made during a Sustainability Assessment.

To do this, Sustainability Assessment makes use of narrative in combination with measurement and maps to analyse and communicate the analysis. Each of these tasks contribute in different ways during the six operational stages of an assessment (see A20). Dealing with the most common task in assessments first:

Measurement provides a set of systematic information. Without it, the assessment would be a collection of impressions and anecdotes. Measurement involves data collection and then organizing, recording and combining the data into a set of indicators to show conditions and trends. Numbers provide participants with a common language for defining performance standards and targets, against which they can consistently compare and evaluate societal and environmental changes.

Mapping (Stage 5 and 6, see also B17) is by far the most efficient and effective way of recording, analysing and communicating spatial indicators. All ecosystem indicators and most human indicators can be expressed spatially. Mapping greatly supports an ecosystem approach to assessment, by showing the distribution of ecosystems, changes in their size, composition and condition, and the effects of human decisions and actions. Maps also oblige participants to tie the measured data to specific locations, thus highlighting where information gaps lie and stimulating participants to seek further information for the whole area rather than only a few locations. The mapping decreases the likelihood that participants will make sweeping statements about a whole area based on only a few data sites (a common practice). Maps can show how indicators are linked, and they aid data interpretation by revealing patterns of performance. Mapping can be done well with inexpensive and easily learned software, notably MapMaker Pro (see Section B18), and does not require large computers or costly and technically demanding programmes.

A20. The Role of Narrative, Measurement and Mapping in the Six Operational Stages

	Narrative	*Measurement*	*Mapping*
(1. Determine purpose of assessment)	(Define the purpose and participants, etc.)	(Not relevant)	(Prepare base maps of the area)
Stage 2. Define the system and goals	Define the area to be assessed. Describe a vision of wellbeing and sustainability for the people & the ecosystem. Define goals that encapsulate the vision. Record these decisions & how they were made	No activity	Prepare base maps of the area
Stage 3: Identify elements and objectives	Identify elements for all dimensions & an objective for each element; explain your choices	Compile and analyse a meta-database (database overview) for each element	Identify sources of mapped data for each element in the meta-database
Stage 4: Choose indicators and performance criteria	Explain and justify all the indicators. Explain and justify the performance criteria.	Define, review & choose indicators for all elements & sub-elements. Choose performance criteria for each indicator	No activity
Stage 5: Measure and map indicators	Draw attention to main findings and explain apparent anomalies.	Set up database. Obtain existing data for the indicators. Organize monitoring systems & surveys to obtain new data. Calculate scores for each indicator.	Map locations of point data. Use the scores to map the indicators.
Stage 6: Combine indicators	Draw attention to main findings and explain apparent anomalies	Combine the indicators into indices	Map the indices
Stage 7: Map indices and review results	Analyse performance, causes & policy implications. Propose policies & actions	No activity	No activity

However, indicators and indices, even when mapped do not explain the subtleties and complexities of the assessment. That is not their job. They are distillations, headlines, and attention grabbers. "Listen up," they say, "this is what's happening, find out more".

The rest of the assessment process tells the rest of the story. This is why narrative must complement measurement and mapping.

Narrative, or written text, is critical to making explicit the subjective choices expressed throughout the assessment, for example in favour of one indicator or element rather than another, and to reveal the assumptions that underpin such choices. The narrative that accompanies a Sustainability Assessment therefore describes the context in which the assessment is taking place, explains the choice of elements and indicators, draws attention to their strengths and limitations, and (where possible) fills gaps with supplementary data. It documents the analysis causes, consequences and implications, and draws conclusions. It explains the meaning of the measurements and maps, without which they would be less informative and could be misleading. It can reveal underlying assumptions, explore connections between indicators and the elements they represent, and show the relevance for policy and action. A21 gives two examples of how additional narrative provides insights about why certain indicators were selected in that specific context, making more understandable what others could otherwise have perceived as a problematic choice.

In **Zimbabwe**, two indicators were selected to represent 'grazing land fires' (under the dimension of 'land' within 'ecosystem wellbeing'):

(1) litres of milk produced per cow per day, and
(2) average weight of cattle.

A narrative accompanied these indicators (Kokwe 1998):

"There was a heated debate on the feasibility of the two indicators. One group held that the indicator 'average weight of cattle' could be susceptible to a number of external influences. On the other hand, it was pointed out that the magnitude of such variables as style of management, type of feed was negligible to pause any threats to the indicator. It was further argued that the indicator could be is easily grasped by the community since it conforms with the community's value orientation vis-à-vis cattle keeping. At last, the indicator was adopted and the performance scale was equally said to be realistic. Regarding milk production in cows, participants argued that this is also a valid indicator because a malnourished cow does not produce enough milk. They further argued that the indicator could also serve as a control for the first indicator since cattle are grazed in the same environment without any separation of heifers and cows from bulls."

In **Dasudi Gram Panchayat**, India, in the system assessment document (Development Alternatives 1999) each indicator was accompanied by an 'explanatory note'. For example, under the dimension 'land', [soil] 'fertility' had been identified as a sub-issue of 'land quality'. The indicator identified was 'land area with average annual production of 400 kg/acre of finger millet as a % of total area under finger millet'. By way of explaining this focus on finger millet, the narrative states: "Finger millet is cultivated in 70-80% of the cultivable land and therefore its production is a good indicator of the fertility of the soil."

In the case of the issue of 'air quality,' the indicator selected was 'women suffering from respiratory diseases as % of total population'. Why only women, one might ask? The narrative explains: "Traditional cooking stoves emit a lot of harmful smoke. Women are affected more since they have maximum exposure."

A21. Example of the Use of Narrative in Wellbeing Assessment in Zimbabwe and India

Valuing a User-focused Process

The value of IUCN's Sustainability Assessment Method lies not only in the measured data, the visual pictures, and the descriptive texts but in its process, one that means facilitating an intense dialogue between people. Measurement, maps and descriptive narrative are relatively common features of a wide range of systematic assessment approaches. Broad-based participation exists in many others. Combining a participatory process with a systematic approach to assess sustainability distinguishes this method from others.

Agreement has to be reached about a vision; consensus is needed about objectives; and choices are required as to the most suitable indicators. For this to be possible, people will need to discuss the elements and formulate a vision. The stakeholder groups that are invited to participate are expected to agree on a common vision of wellbeing and sustainability, the goals, elements, objectives, indicators and performance criteria. The final analysis and proposed policies must also be approved. The process is deeply reflective, challenging participants to think seriously about sustainable development, human wellbeing, and ecosystem wellbeing. Opinions are shared, perceptions adjusted, and relationships built and strengthened.

Aside from these participants, organizational partnerships will be needed to undertake the more technical aspects of the assessment – setting up forums for discussion, collecting data, maintaining the database, performing calculations, mapping and preparing draft reports. This will represent a significant investment for all involved. Considerable skills and commitment will be required.

Therefore, careful selection of those who should be involved is essential to ensure that all critical stakeholders are invited, and important views are not forgotten, and that all existing capacity is harnessed to undertake the assessment (see Stage 1).

- *Who uses Sustainability Assessments?*

In theory, a Sustainability Assessment has the potential to affect a wide range of groups both within and outside the focal area. But this will depend on the level of their involvement. Take, for example, a provincial assessment. Within the province, key decision-makers will be invited to form the steering committee of the Sustainability Assessment process. Typically, these people will be decision-makers within the organizations and agencies, which are, together carrying out the assessment. For example, applications of the method to date have included staff from NGOs and state agencies. During the assessment, a wide range of stakeholder groups in the focal area will be consulted. These groups will provide key inputs around which consensus will have to be built. Inevitably, there will be stakeholder groups that are either not able or willing to engage in the process, but who will nonetheless be affected by the outcome. Some of these groups will be in the province, while others will occupy roles outside of the province. Groups outside the province could include communities affected by downstream water pollution, international agencies funding local initiatives or national-level decision-makers whose policies are being challenged through the assessment process.

- *Who carries out Sustainability Assessments?*

Most assessments that address the wellbeing of people and the ecosystem, in a broad range of dimensions and elements, and in a range of geographical contexts, will be beyond the mandate of any single organization. Usually, implementing a Sustainability Assessment will require forming partnerships between organizations and, possibly, guidance by a *steering committee* that comprises key decision-makers from government agencies, research institutes and NGOs. They will provide the high-level support required to see the assessment succeed. There will also be a *technical team*, which will facilitate the Sustainability Assessment process. The team members will guide all stakeholders participating in the process, organize the consultations, prepare draft reports, collect and analyse data, undertake the mapping and co-ordinate communication of the results.

- *Who else can be involved?*

In the earliest stages of a Sustainability Assessment, it is likely that there will be no local expertise on the method. In the past, IUCN has provided training workshops to local teams and partnerships interested in organizing a Sustainability Assessment. Its aim has been to develop the method of Sustainability Assessment as fully as possible and provide training to local teams with the intention that the local teams would in turn provide training for others. For instance, in Pakistan, the International Assessment Team provided training to three project teams (and their government partners) within the IUCN Pakistan Country Office. The International Assessment Team invited promising candidates from Pakistan to learn the process of training in Sustainability Assessment. This objective still has to be fully realized.

Flexible and Evolving

The IUCN Sustainability Assessment Method is the product of years of field-testing, reflection and writing. The methods have evolved considerably since the early days, and we anticipate that this will continue as we learn new things about doing Sustainability Assessments and using their results. Testing in the field has produced two major recognitions:

- Users can apply Sustainability Assessment in a flexible manner. In the Kit, Sustainability Assessment is presented in its fullest form, with the complete range of stakeholder consultation processes, data handling, mapping and reporting. However, not all users will need a full Sustainability Assessment and may not have the resources to undertake such an endeavour. Sustainability Assessment should serve the purposes of the user, and in the section on 'Scaling an Assessment' (in this Overview), guidance is offered on how to use Sustainability Assessment in a flexible manner. A scaled-back assessment could overcome the constraint of missing data, omit data-handling altogether, produce results despite missing stakeholder groups or make possible a quick and comprehensive issue-scan and use only desk research.
- Recognizing that Sustainability Assessment is evolving should encourage users to experiment, just as IUCN did while developing this method. This Kit represents the best version available at this time, but new ideas emerge constantly both within and outside the IUCN system. Future editions and updates will be able to expand on the focus and methods of Sustainability Assessments and on how results are used. Users are encouraged to communicate their experiences and results to IUCN.

Without these Key Features…

Without these eight key features that have been incorporated into the IUCN Sustainable Assessment Method, the process can degenerate into mere compilations of data from which it is hard to draw useful conclusions. At worst, this means all mess and no message (see A22). Even at best, the assessment's investment of money, time and effort will not return full value in useful information for decision-making.

A22. What's the message? Without a structure to show the relative importance of the indicators, and without performance criteria to show the significance of the indicator measurements, this typical collection of indicators is extremely difficult to interpret.

HUMAN INDICATORS		ECOSYSTEM INDICATORS	
Life expectancy at birth: years	54.7	Cultivated + built land: % of total land	22.3
Child deaths/1,000 live births	87	Natural land: % of total land	27.0
Total fertility rate: children/woman	3.3	Change in area of native forest: %/year	–0.2
Children with low weight for height: %	22.8	Protected area index: weighted %	8.1
Population with access to safe water: %	59	Degraded land index: weighted %	70.3
Real Gross Domestic Product: PPP$/person	4,334	Total suspended solids in rivers: mg/l	1,111
Average annual inflation rate: %	8.9	Water withdrawal: % of renewable supply	29.7
Average annual unemployment rate: %	4.7	Nitrogen dioxide in city air: $\mu g/m^3$	72
External debt service: % of exports	67	Particulates in city air: $\mu g/m^3$	106
Central government deficit: % of GDP	–5.9	Carbon dioxide emissions: T/person	2.01
Net primary school enrolment rate: %	94	Use of ozone depleting substances: g/person	18.8
Net secondary school enrolment rate: %	49	Threatened higher plant species: % of total	35.6
Adult literacy rate: %	81.8	Threatened higher animal species: % of total	7.9
Main phone lines + cell phone subs/100 persons	12.3	Threatened animal breeds: % of total	6.8
Homicides/100,000 population	24.1	Energy requirement: gigajoules/person	73.8
Assaults/100,000 population	358	Food crop production: T/ha harvested area	4.4
Military expenditure: % of GDP	1.8	Fertiliser consumption: T/100 ha harvested area	6.8
Ratio of richest 20%'s income to poorest 20%'s	19:1	Fishing capacity: T/km^2 of continental shelf	0.3
Female share of earned income: %	30.9	Fish catch: T/T of fishing capacity	7.1
Female share of decision-making posts: %	16	Timber removals + imports: % of volume	2.5

With these features, assessments can help people to reveal and analyse:

- conditions and trends related to the human side of the equation;
- conditions and trends in the ecosystem;
- overall progress toward sustainable development;
- conditions and trends of major components (health, economy, land, species diversity, etc);
- elements where performance is weakest (or strongest);
- key relationships, such as benefits from resource sectors per unit of ecosystem stress;
- priority information gaps that need to be filled to improve our understanding of sustainable development in the area being assessed.

For examples, see Stages 6 and 7 and the case studies in B5 and B6.

Scaling a Sustainability Assessment

Throughout this Resource Kit, the full cycle of Sustainability Assessment, along with technical considerations, teaching notes and tips for facilitating in the field is presented in its most complete form. However, Sustainability Assessment can also be applied in abbreviated or thematic forms, using a shortened cycle or focused stages in the cycle. Users should also be aware that a second cycle of the Sustainability Assessment presents its own challenges and methodological data and process requirements.

There are essentially four different scales of Sustainability Assessments (all four are described in more detail below):

- A **full** Sustainability Assessment that follows the entire cycle;
- An **abbreviated** Sustainability Assessment that uses some of the steps, or some of the techniques;
- A **research-driven** Sustainability Assessment that may use the entire or partial cycle with a more closed set of themes;
- A **second** Sustainability Assessment, building on an initial baseline assessment and activities that followed.

A Full Sustainability Assessment

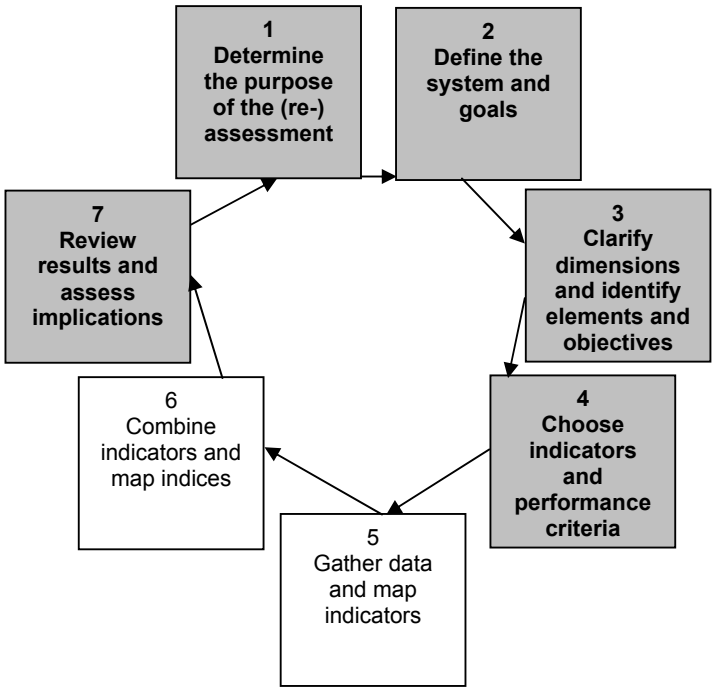
A full Sustainability Assessment follows all seven stages in the assessment cycle. The general purpose of such an assessment is to engage in reflection about sustainability (Stages 1 to 4), collect data for indicators, combine indicators and undertake analysis based on the indicators (Stages 5, 6 and 7) and use the data and process to assess priorities for action (again, Stage 7).

In Stage 1 (Determine the purpose of the assessment), potential users will be asked to clarify the purpose of the assessment (why?), its intended audiences (for whom?), who will be involved (who) and the scope of the assessment (what?). The assessment could follow all of the stages making the geographic scope as large as necessary and employing whatever degree of participation and stakeholder involvement is deemed necessary.

How to use the method, train people in its use and apply a full Sustainability Assessment are covered in detail in Stages 1 through 7 and Sections B8 through B15.

An Abbreviated Sustainability Assessment

In the face of scare resources – time, money, personnel – and urgent information- and decision-needs, Sustainability Assessment can and has been applied in abbreviated forms. The Nicaragua case study (B7) is an example of an assessment process that did not rely on a high degree of data handling. This section deals with Sustainability Assessments that do not follow the entire cycle, rather than those that use small geographic scales or limited stakeholder consultations.



A23. A Reflective-Process-Only Sustainability Assessment.

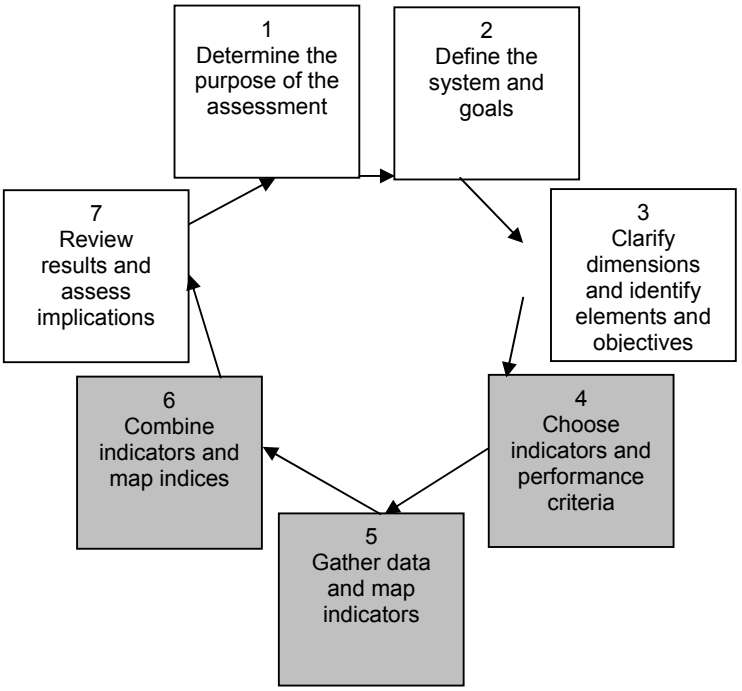
Sustainability Assessments are a combination of a **process of reflection** and **exercises in data-handling**. When combined, a Sustainability Assessment can be both thought provoking and scientifically rigorous. However, there are plenty of reasons to limit the focus on the process or the data-handling procedures of an assessment.

- Sustainability Assessment can be used as a **reflective process only**. Some applications may not require precise data to verify the reflection process, or data may simply not be complete or available. The situations in which this process can be most effective are listed in A6. In short term they can be listed as obtaining a more solid base for determining priorities, raising awareness, gaining consensus, stimulating critical debate and enhancing local ownership of programmes.

In a reflective process, the Stages that work with data are not as important as Stages in which users have an opportunity to think specifically about sustainable development. A23 shows the Stages that would be used in this process as shaded boxes. The Sustainability Assessment could start normally by deciding the purpose and who would be involved. Stages 2 to 4, from developing a broad vision of sustainability to choosing performance indicators would likely by similar to a full assessment, but could be accomplished without reference to the availability of data. Stages 5 and 6 that deal

directly with data collection and combining indicators could be omitted completely, or be based on opinions. Alternatively, it could be useful for participants to use estimates, if only to get a sense of performance of the various components of their system. With every assessment, the final stage – in which performance is analysed and implications are assessed – would be critical for tying the reflection process to any actions that follow.

In rare cases, the technical information on developing indicators, gathering data and combining indicators will appeal to some users and uses. In well-established processes, the technical information on **data-handling** has added a new dimension by allowing the analysis to use performance indicators that can be aggregated to show themes, overall human development or the state of the environment.



A24. An Input-focused Sustainability Assessment.

A24 shows the Stages that would be most useful (shaded) as an **input to another process**. Using only the data-handling techniques assumes that there is already an existing process that has its own procedures for setting the scope of the assessment, its purposes, identifying stakeholders and key themes. It is also assumed that the process of analysing results is also well established.

The Stages most relevant to working with indicators and data are 4 through 6. In Stage 4, the user could define high-quality performance indicators and use Stages 5 and 6 to collect data, calculate scores and combine the results as input to the analysis process.

Research-driven or Thematic Assessments

A research-driven or thematic assessment differs from a regular Sustainability Assessment by focusing on a particular aspect of sustainability. IUCN has developed materials on thematic assessments of biological diversity[5] and forest conservation to

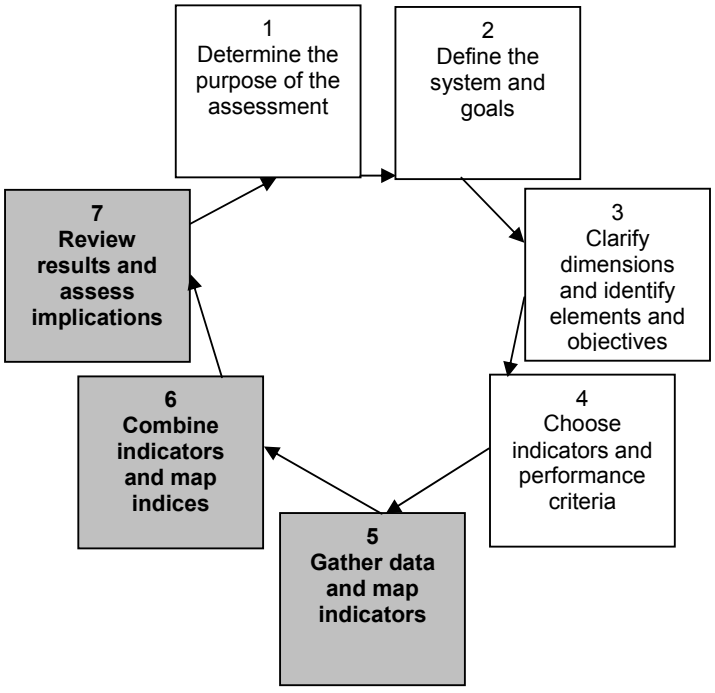
[5] IUCN Biodiversity Policy Co-ordination Division and Monitoring and Evaluation Initiative (2000) *An approach to assessing biological diversity*, IUCN, April 2000.

illustrate the condition of these themes in terms of both human and ecological aspects. A thematic assessment can be helpful in opening up or elaborating on a specific sector and can follow either the full or abbreviated assessment cycle according to the needs of the user.

A Second Sustainability Assessment

Sustainability Assessments are intended to provide guidance for action in a particular geographic area. If a group of users or stakeholders have undertaken an assessment, it is possible to use a second assessment to track how things have changed in the system or with other tools, the impact of activities undertaken.

To be consistent with the previous assessment, a second assessment could use the same vision, dimensions, elements, objectives, indicators and performance criteria. However, it is worth revisiting all stages, particularly if the results are to be used for new purposes, or new stakeholders have been identified. Otherwise, only Stages 5 through 7 need to be repeated. A Sustainability Assessment can help put in place a long-term monitoring system, for which data would be collected on a regular basis. Ideally, the results and analysis could be used to inform decision-making on a regular basis, so perhaps a second assessment would be less formal. A second assessment is also more likely to provide input to a process of impact analysis – to assess how activities undertaken since the first assessment had created change – but these results must be used with other tools specifically related to impact analysis.



A25. A Second Sustainability Assessment.

Stage 1. Determine the Purpose of the Sustainability Assessment

Stage	Narrative	Measurement	Mapping
Determine the purpose of the Sustainability Assessment	• Define the purpose, uses and users of results for the assessment • Determine who will participate in the assessment • Determine who will undertake the assessment • Determine how the assessment will be undertaken	No activity	No activity

Too often, studies and assessments are undertaken simply because they are interesting. Unfortunately, this approach does not lead to much change. Without a proper commitment to the assessment process by a range of interested parties and a commitment to using the results, the effort will not lead to change. The simplest way to ensure that results will be used is to match the purpose of the assessment with the needs of users. This stage uses a questioning approach. It assumes that if potential participants hold the suggested discussions and negotiations, they will be in a much better position to undertake an assessment and use the results.

Define the Purpose, Uses and Users of the Results for the Assessment

Assessments never happen in a vacuum. Organizations interested in assessment will already be undertaking a multitude of activities, ones that reflect their mission and competence. Ideally, a Sustainability Assessment should complement these ongoing activities by providing information in a more complete and systematic manner that can then be used to support decision-making. This is the general goal – but it will have different meanings to different organizations. They may need to undertake Sustainability Assessments to better identify priorities, measure baseline conditions, or collect data for monitoring, evaluation or impact analysis. Therefore, this stage helps guide organizations to identify more precisely how a Sustainability Assessment will be useful to their daily work.

Assessments are almost never undertaken solely by one person or one organization. In a large geographic area, there are many organizations – governmental and non-governmental – that will have a stake in generating good information about human and ecosystem wellbeing. Many of these organizations will already be working together. Each of these organizations will have competence and expertise related to specific parts of sustainable development. A Sustainability Assessment is a good process for bringing

together these organizations so that they can share expertise, and solve problems together. However, as above, it is vitally important to clarify why each organization wants to participate and why.

The practicalities of Sustainability Assessments dictate that tasks and decisions will be shared. It is important to identify properly who should be involved (either as a stakeholder or as someone driving the assessment), their goals and needs, and how the assessment process may meet those needs.

Before embarking on this insightful yet time-consuming process, a system assessment must be well organized. System assessment is often initiated by one organization, which might or might not, invite other organizations in to drive the process. But who would be best to invite as a partner and how much would such an assessment process cost? This will depend on what the assessment aims to do.

Organizing to undertake a system assessment requires finding answers to five questions:

1. Why is the system assessment needed?
2. For whom is it intended – who will use the results?
3. What will be the scope of the assessment?
4. With whom will it be undertaken, and how will they participate?
5. How will the required tasks be undertaken, and what is the overall sequence?

These questions are inter-linked, and will therefore need to be revisited several times. For example, when new stakeholders join the process, the original purpose will need to be reviewed and adjusted, if necessary to include their needs.

Clarify the Purpose of Assessment

At the beginning of this Resource Kit, the various purposes of an assessment were discussed (see page 4). This question needs to be answered at the onset of each assessment. Why is the system assessment needed? What is it hoped to achieve? For what purpose will the intended users apply the assessment results? This question is essential. The nature of the assessment changes radically depending on whether it is intended primarily (a) to raise awareness, or (b) to provide broad policy guidance, or (c) to provide the basis for developing and implementing specific policies and decisions.

Clarifying the answer to this question also helps to establish the minimum final output. If the assessment is needed to provide broad policy guidance, then it needs to draw a few major conclusions besides providing a clear overview of the context in a manner that has not been achieved with previous assessments. It may be used to decide priorities among a number of competing issues, in which case it should show the state and trend of each issue, and their responsiveness to intervention. It may have a more general purpose, such as helping resource users and managers to focus on integrated action for both human and ecosystem wellbeing. In that case, it should portray the conditions of both convincingly, and particularly the underlying patterns of performance (see Stage 7).

Clearly, the answer to the question of core purpose is closely linked to that of the next question on who uses the outputs (see A25), and will need to be revisited when new stakeholders join the process.

A26. End Users and Purpose of a Sub-district ('taluk') level System Assessment in Jasdan (Gujarat, India)

For Whom?	Why?
1. GRISERV Project staff (local NGO)	• to get baseline data for project and help with Monitoring & Evaluation design
	• to identify possible partners and threats
2. BAIF, Pune (national NGO)	• to have an example for learning about using and training in SAWS, and understanding changes in a system
3. GRISERV, Gujarat	• to change BAIF policy
4. Forest Department	• to understand current state/use of forest for better roles/support to people
5. District Rural Development Agency	• to help define its mission and priority support areas/themes
6. Women in project area	• to recognize their indigenous knowledge and their natural resource management practices
7. Men in project area	• to empower them, if they are involved appropriately
8. Committees + self-help groups	• to help them / plan and implement their role in Jasdan better
9. People outside project area	• to help them when demanding projects by giving them clear arguments
10. ANARDE staff (local NGO)	• same as 1
11. NGOs outside Jasdan	• same as 2,3
12. Agro-service centres	• unsure, as these groups are likely to be affected by the assessment but might not necessarily benefit from it

Identify the End Users with Stakeholder Analysis

Stakeholders in a Sustainability Assessment include a wide range of actors – for example, those with responsibility over decision-making, those who will be affected by decisions resulting from the assessment, and those who have information, data and expertise to contribute to the assessment. A good assessment will balance all three types of actors.

Users of the assessment results can, and should, be identified at the outset. A stakeholder analysis can help identify who should be involved, what their needs are and any gaps that exist. It is very likely that logistical and financial limitations will prohibit the involvement of all the people and groups who might use the assessment results and process. Prioritizing stakeholders can help ensure that a balance is struck between a manageable number of stakeholders and an adequate coverage of needs and issues.

While this kind of analysis is indispensable at the onset of an assessment, stakeholder analysis is also useful at regular intervals to assess whether, and if so, which, new stakeholders should be invited into the process.

Defining a Stakeholder

Generally, a stakeholder is identified as being anyone with a "stake" or share in a particular issue or geographic area. Stakeholders can be individuals, organizations, formal groups or informal associations. They can be from any level, from households to community to sub-regional, national or supranational. Choosing which level of decision-making is most important for the planned assessment –trying to please all stakeholders at all levels is likely to fail.

To understand who might be a potential stakeholder, users need to be clear about the range of "stake" or "share" in the area being considered. This question is closely linked to how assessment results will be used, and care must be taken to ensure that the potential uses of all stakeholders are identified.

A Sustainability Assessment deals with three broad categories of stakeholders:

- Stakeholders who *depend* on resources, services, etc for their survival and wellbeing. Ultimately, decision-making should increase wellbeing for these stakeholders, not further marginalize them.
- Stakeholders who have *responsibility* for managing resources, making decisions about services or allocating funding. These stakeholders must make decisions in an informed manner, and not trade human development against ecosystem protection, or vice-versa.
- Stakeholders who have *expertise*, information, maps or data about elements critical to the assessment. These people have a responsibility to participate, although their contributions can be made through consultation and review.

The three generic categories are by no means mutually exclusive. An individual may fall into two or all three categories.

Choosing Stakeholders

The intended scale of the assessment is directly related to who will use results and who should participate in the process. A very large assessment, covering a significant population and geographic area should encompass a larger stakeholder group. If the assessment is intended to be used widely for decision-making, for instance in the development of regional policy, then it is important to ensure that an appropriate mix of stakeholders from all three categories are included to ensure legitimacy.

The process of choosing stakeholders is a negotiation. It is probably not possible to immediately identify each stakeholder with a "stake" or "responsibility" in the assessment process. This process could take several rounds and could result in some stakeholders being excluded and others sought out to be persuaded to take part.

There are three critical questions that can help guide the process of prioritizing stakeholders to ensure balance and legitimacy (these must be combined with the categories above as well):

- Do the stakeholders represent a broad range of themes? Using the suggested dimensions (see page 4), a representative stakeholder group would have a stake and responsibility in all of the dimensions and a balance between human and ecosystem wellbeing. At the same time, it is possible to have too many experts on a single topic.
- Are all the key stakeholders who will be most affected by the assessment represented in the stakeholder group? For example, if this is a national assessment, are all the federal departments adequately represented?
- Are all the stakeholders prepared to make decisions at the chosen level? It is acknowledged that assessments can produce wide effects and benefit, but it is not practically possible to anticipate and work with all of those possibilities. If the assessment is intended to inform regional decision-making, then the first priority must go to stakeholders who have a need or use for the results and feel comfortable about contributing at that level.

After an initial listing of stakeholders, the list needs to be prioritized to avoid an unwieldy list of participants. The filtering process requires users to be clear about the criteria and how they are to be applied. There are many ways in which stakeholders can be identified and the prioritized. It could be carried out simply by a small project team if it gathers and identifies stakeholders by assessing their needs and inviting them into the process. The process could also be prolonged, requiring several meetings in which potential stakeholders discuss their potential involvement and an agreement is negotiated

A27. The Role and Tasks of Stakeholders in a Sustainability Assessment

Role	*Tasks*
Technical support team that facilitates the assessment	• undertake stakeholder analysis, inviting participants • organize practical aspects of the workshops such as database management, communication strategy • helps participants to: - identify elements and objectives - choose indicators and decide performance criteria - analyse findings for policy and action recommendations
Steering committee	• monitor the process and progress of the team • help facilitate participation of key users • act as a policy channel (or help to facilitate use of results)
Primary users or stakeholders	• identify elements and objectives • choose indicators and decide performance criteria • analyse findings for policy and action recommendations
The wider stakeholder groups and other decision-makers who influence the system	• discuss implications of results, via presentations of narratives, measurements and maps

Who Should Participate When?

It may not be appropriate to include all selected stakeholders at all steps in the assessment, nor may they be interested or able to participate in all stages. For instance, a donor agency may not be as concerned with participating in the assessment process, instead preferring to use the results to develop their aid programme in the area. On the other hand, without the participation of certain groups, for example women in a local level assessment or tribal groups in a regional assessment (see A28 and A30) the assessment process will not be representative and therefore will lack legitimacy. Clarity on who will participate when during the process will help ensure that needs are met, topics adequately covered and results are used.

- Who will participate in assessment decisions? Who should help develop the vision for the area? Who should help identify topics for detailed analysis? Who will help analyse the results, both in specific topically related terms and generally? Who among the stakeholders is concerned only with the resultsand will not participate intensively in the process?
- Who will help support the process? Who can help mobilize resources? Who can draw in reluctant but important stakeholders? Who can help facilitate the process? Who can provide information, data and maps? Who can provide opportunities for use of the results?

The answers to these questions will initially help identify who should be involved during the process, but will need to be revisited once the assessment process is planned in detail.

A28. Enabling Participation of Marginalized Stakeholders

To make it possible for marginalized groups or individuals to take part in the assessment process, think about the following questions:

Timing: When do the marginalized have free time for the meetings/activities that are being planned?

Location: Where do the marginalized feel comfortable about meeting? Where are they allowed to meet?

Team members: Are the assessment team members trained in and sensitive to finding ways of involving marginalized stakeholders?

Topics: Are the marginalized groups/individuals raising their own issues? If the dominant groups raise issues that may be important to the less powerful ones, are their opinions asked? Are the more powerful engaged in discussions on issues for the marginalized? If people speak on behalf of others, what attempts are made to check the validity of what is being said?

Assessing input: Do marginalized groups/individuals feel able to have an equal voice? Is the facilitators' help needed to ensure this? Will separate meetings be effective? What else is needed to make sure that the ideas and information from all sides are given equal weight?

Picking the Right Level

IUCN's Regional Office for West Africa proposed an assessment process that would encompass 17 West Africa countries (see page 13 and A29). Upon negotiating with potential partners, IUCN West Africa learned that the most interested parties would use assessment results to draft regional policies for West Africa, determine priorities at the regional level for donor agencies and eventually assess long-term change at the regional level. As West Africa has a number of regional integration organizations, it was necessary to seek out and negotiate the possibility of their participation and use of the results. At the same time, an earlier decision to undertake community level consultations in several West African countries was rejected as unfeasible and inappropriate given the regional focus. To ensure that the assessment reflects the broadest understanding of sustainability in West Africa, the team has planned to consult a wide range of regional experts and studies in order to ensure a comprehensive assessment that covers the broadest range of themes relevant to the region. The project team noted that two distinct types of sustainable development issues affect the region – those relating to the dry Sahel regions and those concerning coastal countries. This meant that two distinct lists of stakeholders were developed to ensure both areas were included.

The Focus of the Assessment

Once the purpose of the assessment is clear and it is ascertained who will benefit from being involved, it becomes much easier to assess the scope of the assessment (see A29). What is going to be assessed? What subjects will be covered (full system assessment or thematic/sectoral assessment) and what is the geographical scope? This question is discussed in detail in Stage 2 of Part A.

A29. Determining the Scope of Assessment in West Africa

In West Africa, the process of determining the scope of the assessment took a considerable amount of time and consultation. IUCN, in partnership with a number of regional institutions and UNEP, was interested in developing an assessment process that covers all of West Africa.

Determining what lies within West Africa turned out to be more complex than anyone thought. In what is traditionally known as West Africa, there is a dryland area known as the Sahel, which covers parts of nine countries. This contrasts with the coastal zones, covering parts of another seven. Economically, parts of West Africa share a common currency and market, but this applies to only eight countries. Different regional institutions, covering politics, economics and environment bring together differing numbers of countries. In short, there was no single institution or that claimed to work with all of the countries intuitively associated with West Africa.

The 17-country scope of the current assessment emerged as the result of a number of regional consultation workshops. In the end, the assessment will cover countries that are interested in participating and who have a stake in regional policy-making processes.

A30. Thinking about Women's Participation (adapted from Guijt and Kaul Shah 1998)

- *Ensure gender-appropriate forums and spaces by asking women and men where they feel at ease.* Much of the assessment work relies on group-based analysis, so care needs to be taken in deciding where to meet, how to work with groups, and understanding the composition and dynamics of groups even if single-sex.
- *Ensure gender-appropriate timing of opportunities for participation.* Communication and social change take time and not everyone has it, least of all women. For women to sacrifice precious time, they need to be convinced that they will be better off for having been involved. To gain men's support for women to spend time in meetings, seeking the approval of local leaders can be essential.
- *Understand the practical conditions that can make or break women's involvement*. Even if women are willing to participate, they may be hindered by the need to arrange childcare, obtain a husband's permission, etc.
- *Encourage women to use the moments of participation.* Do not assume that women are able, willing or even interested in taking the space that has been created for them. Active effort may be needed to include the more inhibited and encourage them to express their concerns.
- *Be clear which women are and are not involved.* It is easy to listen only to those who are more vocal due to a higher status and/or more experience with public speaking – and incorrect to assume that these are representative of all women.
- *Find (combinations of) methods that can analyse gender issues.* Use methods and questions that are culturally appropriate and can explore gender relations with women and men alike. Maps, life histories, and a questionnaire survey can be used in sequence to understand the impact on women of changes in forested landscapes. But not everything can be surveyed or visualized, such as psychological wellbeing and domestic violence. More appropriate methods to help identify issues or indicators can be video or theatre.
- *Use methods not only to describe gender-differentiated needs but also to analyse the causes of needs*. Anyone can make a map or list priority needs but this does not mean that the underlying causes are understood.
- *Ensure that issues being discussed are interesting to women or that these issues can arise.* Before starting, try and identify whether a particular topic is best investigated by asking women or men. Explaining what will be discussed beforehand can help women to formulate their ideas in advance.
- *Learn to recognize and handle conflicts.* Even methods that appear gender-neutral can be the cause of household-level and community-level conflicts, so try to understand which topics may be likely to provoke confrontations. Ensure that facilitators are skilled in conflict resolution.

Agreeing on the Sequence of Tasks and Methods

Once all the core decisions are in place, agreement must be reached on the timing and sequence of the different steps (see A31). What method(s) will be used and in what sequence? What are the available resources? What are the constraints? (see A32) And how long will all of these steps therefore take? It is essential that these discussions are held and decisions made with those who are expected to carry them out.

An information analysis will also be necessary at this stage to establish what statistics and other data are available, their characteristics (coverage, compilation frequency,

etc.), where they are kept, and how they can be obtained (see 'Compile a Meta-Database').

It is then necessary to decide the resources required in terms of people, equipment and money. If the participation of many different groups is envisaged, a significant investment in facilitation will be required and more time will be needed. The benefits from well-managed participation are usually high, but the initial costs are greater than acting alone and hoping for the best. If the money is not available, or certain key players are not going to take part, the assessment will need to be tailored accordingly.

A31. Process in an Assessment in India (Development Alternatives 1999) (see B5)

How ?

- An assessment team was first formed consisting of representatives from the regional office and the field centre of Development Alternatives (DA, a large NGO)
- An action plan for the assessment was prepared.
- The format for the assessment was prepared in English and the vernacular language (Kannada), using IUCN material.
- Primary data collection was done through random household survey
- Gram panchayat members were briefed about the need and importance of the assessment and were requested to initiate a meeting. Discussions were then held among the stakeholders (representatives from DA, community, and government institutions) during which the prepared format was presented in Kannada. The systems methodology was explained and each indicator was discussed in detail
- Feedback from these meetings was incorporated into the indicator definition and data for each indicator was collected, including through mapping.
- Four rounds of discussion were held, and the final format for assessment and indicator values was prepared.
- A final meeting was held for stakeholders when information was presented.
- Discussions were held on the role of the community, NGOs, and government institutions in achieving the specific objectives for sustainable development of the area.

A32. Methods, Resources and Anticipated Constraints in India (IUCN/BAIF 1999)

Methods:

- Seek secondary data
- Validate secondary data via sampling
- Participatory planning with the core group
- PRA (Participatory Rural Appraisal) methods – Census type data – technical collection

Resources available

- Satellite data
- Census data
- District gazetteers
- Taluk/panchayat (local authority) records, research institute, rainfall data
- Organizers' facilitation skills
- Revenue, Agriculture, political maps
- Government line department records
- Local traditional knowledge
- Junagadh university research data
- Vehicles / motor bikes
- Computer
- An NGO keen to do assessment

Constraints anticipated

- Lack of computers
- Lack of co-operation between departments
- Making data available too late
- Inaccurate old data
- Cost of satellite data and everything else
- Trade-off between time required and local participation
- Analysis required for raw data
- Understanding of data, especially satellite images

Communication and the Sustainability Assessment Process

Even the best-designed system assessment in the world, when not communicated, will be ineffective. Therefore it is essential from the start to consider the communication strategy to be adopted. Decision-makers at all levels (community, country, corporation, NGO or some other entity) are more likely act on the assessment if:

- The main findings are presented succinctly (a few main findings only);
- The implications of the findings are highlighted;
- Options for acting on the findings are clearly spelled out, including the costs and benefits of taking or not taking the actions.

To do this well, the following questions need to be answered:

- For each intended end-user group, what information will it need?
- What is the ideal format/style of communication?
- What frequency of communication is required?
- Who is to be responsible for ensuring the communication is produced and then distributed?

Preparing a simple table (see A33) to organize the communication process can ensure that these questions have been considered. It can be revised as and when the end-user/stakeholder list changes.

A33. Meeting Communication Needs (material to be produced at each stage)

End User (or Audience)	*Role in the Assessment Process*	*Information to be Communicated*	*Format/ Style*	*Frequency of Communication*
Government extension staff	To provide data on their sector, and help make decisions during the assessment stages	Scope, purpose and method of assessment, potential benefits of system assessment for them, outputs from each stage	Copies of outputs of each stage, decisions made by core team plus implications for them	After each meeting of core team; outputs as they become available
Village leaders	To support assessment process, participate in assessment decisions, and use outputs for leadership decisions	Scope, purpose and method of assessment, progress reports on assessment process, problems arising,	Verbal updates of the process, copies of outputs of each stage, decisions made by core team plus implications for them	Weekly updates on progress; outputs as they become available

Stage 2. Define the System and Goals

Stage	Narrative	Measurement	Mapping
Define the system and goals	• Define the area (the system) to be assessed • Formulate a vision of wellbeing and sustainable development for the people and ecosystem of the area • Define goals that encapsulate the vision • Record these decisions and how they were made	No activity	Prepare base maps of the system

An effective assessment will start by answering two key questions. What geographic area is being assessed and what are the aspirations of those living in the area being assessed? Within Sustainability Assessment, this is known as 'defining the system' and 'defining the goal'. Without this definition, there is clarity neither about the unit being analysed (society and ecosystem) nor the overall vision for sustainable development. The system goal is defined by the participants who have stakes in the system being assessed, and is thereby valid for that particular society and ecosystem. By defining the goal, participants make explicit their vision of sustainable development, the future they seek for themselves, their community, and their environment. A properly defined goal makes it possible for participants to understand their present condition and where efforts for improvement can be concentrated.

Clearly this stage is one of considerable reflection. Defining the system and goals asks users to define sustainable development in their specific geographic context, while also allowing them to articulate their ideal vision of the future. Discussing the vision will include debates on what 'sustainability' means for the participants and what values drives them as a society.

Define the Area to be Assessed

The system is a spatial area comprising people (human communities, economies and related aspects) within an ecosystem (ecological communities, processes and resources), together with their interactions (A34).

From an ecological perspective, the system consists of different spatial levels, from the planet as a whole to a particular habitat. Although the levels affect each other, the decision-makers and decision-making processes differ with each level. Individuals make key decisions at the household level, national governments at national level, and so on. Note that information is usually specific to a spatial level because data is usually collected according to specific administrative units that are defined geographically. It is important to select the administrative level that combines the best opportunities for data and meets the needs of the users of the assessment results.

Consequently, to use information efficiently and influence decisions, assessment participants need to start by defining a series of assessment levels. This will help them be aware that other levels exist, and to justify why they chose one on which they will focus the assessment work. The level on which the assessment focuses is called the *focal level,* which is simply the highest spatial area on which the assessment will focus and is thereby defined by the outer boundary of the area to be assessed. The focal level of a national assessment of Bangladesh would be the entire country of Bangladesh (A34), showing variations of wellbeing within the country and thus producing an overall picture. The focal level of a sub-national assessment of Bangladesh might be one Division, and would show variations of wellbeing across that division (in the districts) besides producing a general assessment of performance.

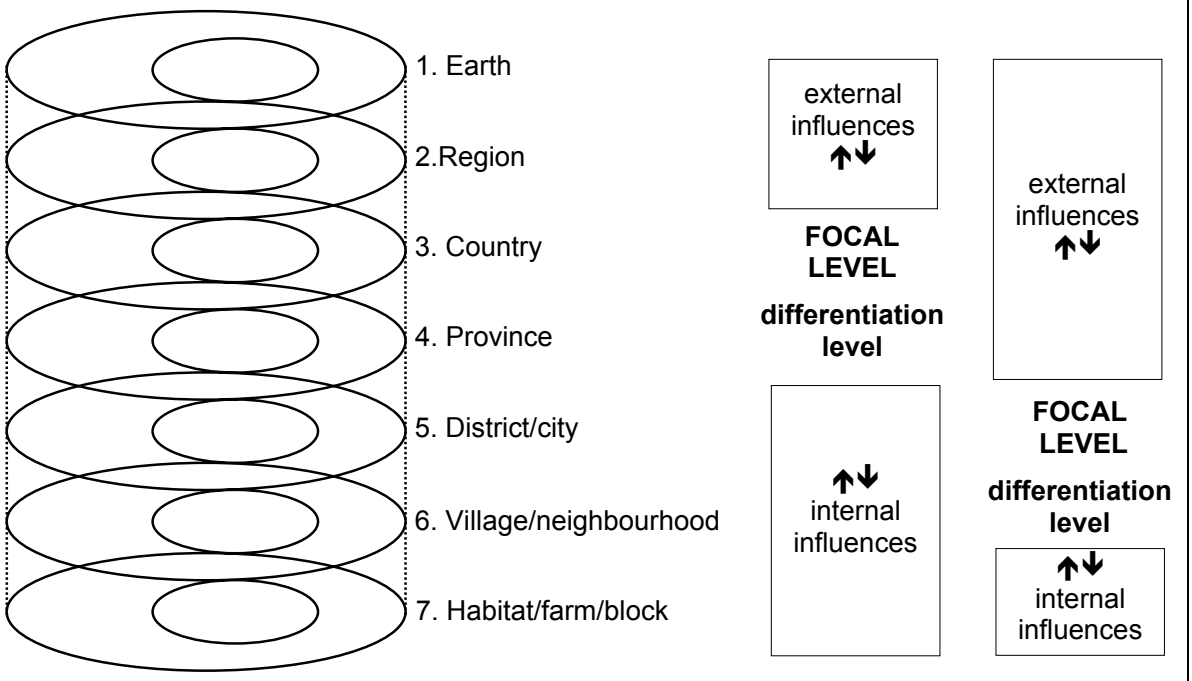
A34. Spatial levels (note that the number of components is much larger at lower levels)

Levels	Bangladesh	Chittagong	Italy	Switzerland	Ticino (Switzerland)
Level 1	1 nation	1 district	1 nation	1 nation	1 canton
Level 2	6 divisions	20 thana	20 regions	26 cantons	8 districts
Level 3	64 districts	195 unions	103 provinces	187 districts	38 sub-districts
Level 4	490 thanas	1,039 mouza	8,102 communes	3,028 communes	247 communes

A picture of the average performance over a large geographic area would not show where specific action is needed. Such information would only show average ecological and socio-economic conditions for the entire area and not differences that may occur from one part of the focal area to another. Illustrating differences in performance spatially is the only way to be sure where to concentrate action. For example, an assessment of Asia that did not distinguish countries would portray the entire continent as uniform, as if conditions in Bangladesh were identical to those in Japan. To show this variation within the focal level, it needs to be sub-divided into smaller spatial units.

Using information from a smaller geographic level, known as the *differentiation level*, solves this problem. The differentiation level is usually the geographic unit or the level immediately below the focal level. This is done in order to avoid dealing with too many units, as the number of units increases further down the hierarchy. For instance, an assessment of Italy could differentiate by 20 regions or 103 provinces. More units means more data has to be collected. The result is a more costly assessment that is more difficult to communicate. In Italy, it is likely that an assessment would differentiate by the 20 regions, rather than the 103 provinces. There is a trade-off of which users should to be aware. If data is collected at the level of province and not region, then it would probably be necessary to differentiate at the provincial level. However, stakeholder consultations could still take place at the regional level, if a meaningful and clear aggregation of provinces into regions can be identified.

Spatial levels are most easily understood when defined in terms of administrative units for two reasons. First, administrative units are the units of decision-making, and the assessment is meant to influence decisions. Second, most economic and social data are collected according to administrative units. However, spatial levels may also be defined ecologically (e.g. ecoregions), hydrologically (e.g. drainage basins), or in other ways.



A35. Focal and differentiation levels: examples of a national and a city assessment

A35 also shows some examples of how different focal areas can be differentiated. Countries can differentiate a region. To describe a particular aspect of sustainability within a region, the users would want to be able to point out how performance differs in each country, rather than just for the region as a whole, or perhaps people want to compare a single country in the region to the average of the region as a whole.

The ideal choice of focal/differentiation levels for an assessment is the one that is most useful for decision-making, most revealing for analysis, and most practical for data collection. It may not be possible to satisfy all these criteria. Where the need for data is not driving the assessment process, the choice of focal and differentiation level will be related directly to decision-making needs rather than gathering data. For example, an organization seeking to define needs for West Africa would not need to an assessment that encompasses the entire African continent. The focal level helps ensure that assessment results and analysis are more location specific so that relevant decisions can be made.

The choice of focal level depends on two factors: the purpose of the assessment; and the likely number of differentiation levels. This is often a straightforward decision. An assessment to support national decision-making, by definition, must cover the nation. Selecting a focal level can be tricky sometimes, especially when the purpose of the assessment is to analyse the context of a project that covers a watershed or ecosystem that cuts across administrative boundaries. In cases like this, the focal level needs to encompass the watershed or ecosystem concerned *and* the administrative units that it overlaps.

What is the best unit for the differentiation level? An assessment is not merely an information gathering exercise. To be effective, assessments require the participation of decision-makers and those who influence them in the area being assessed. Hence, choosing a differentiation level should also help define who should be a participant in the assessment process.

If a continent-level assessment, say of Latin America, had no differentiation level, then the continent would seem uniform, and we would not see the differences between the Bolivia, Peru, Ecuador, etc. The same is true for a wellbeing assessment that compares, for example, an Indian gram panchayat[6] that consists of three villages. The focal level is the level at which all the information from the different villages is shown together, the gram panchayat level, to show a summary of the area (see Section 5 of Part B). The differentiation level is the level from which the information is used (or collected), in this case the village level, which allows us to see on the map of the district or indeed on the Barometer of Sustainability how the different villages in the area compare within the overall picture of the focal level, i.e. the district.

Also, if only the focal level is considered, then the assessment will ignore the extent to which it influences, and is influenced by, levels above and below. It is important for users of an assessment to be aware that other levels exist, which will be affected by the actions they take as a result of the assessment, and similarly, will be affected by actions of other levels. Awareness is the key here; it is not necessary to trace cause and impacts to other levels when assessing the state of the local system. For instance, if water use is going to have an effect in another jurisdiction outside of the scope of the assessment, the participants should be aware of this and set stringent performance criteria as a result. It is not necessary to go into the next system to measure the effect of their actions, only to be aware that they exist. A35 shows how influences to and from higher levels are considered 'external', and influences to and from lower levels are considered 'internal'. In a Wellbeing Assessment, identifying the key influences and (if possible) assess their effects is sufficient, without tracking them from level to level.

The ideal and most informative arrangement is to use all three classifications: administrative, ecological, and hydrological. This is quite easy to do with mapping (see 'Record Decisions and Prepare Base Maps' in this Section, page 51). For example, a strictly bio-geographical classification may be the most revealing for analysing conservation performance but not very useful for decision-makers because it cuts across their administrative boundaries. Sometimes a hybrid is necessary. In a wellbeing assessment for British Columbia, a combination of administrative and hydrological levels was used: country (Canada); province (British Columbia); regional basin (e.g., South Coast); basin (e.g., Vancouver Island). This was because of multiple administrative divisions, with each government ministry dividing the province in its own way for the purposes of management and data gathering.

Develop a Vision of Wellbeing and Sustainable Development

Participants develop a shared view of what world they are aiming to create by painting their own picture of wellbeing and sustainable development. This picture becomes the basis for defining goals and objectives. It is the standard against which the assessment

[6] The lowest level of elected government in India.

will measure progress. A vision is not a plan. It is an ideal future scenario that has been made explicit, and presented as if it has already happened. From the general vision can flow more specific ideals to help defined the rest of the assessment.

A36. Example of Vision Development for Goal Identification (mimeo 1998)

"We started by asking the participants [seven field staff] to draw rich pictures of the present situation of any representative family they were working with, showing the resources available to them. We got four distinct 'families' – landless, marginal landholder, medium holdings but alcoholic, and landlords. The next step was to think through and imagine the possible changes in this situation 10-15 years from now , and another one of a distant 'future'. These being perceptions of project staff, the 'future' was more of an outcome of project activities, but it was a good place for us to introduce the conceptual framework… Then we moved on to understand their meaning of wellbeing, simultaneously categorizing their statements into ecosystem and human wellbeing aspects. The dimensions of each subsystem emerged."

Developing a vision is quite different from a stocktaking of problems. An ideal world would solve the problems of today, while maintaining what is good. Reflecting on a vision produces a much richer picture than could be developed by focusing exclusively on problems.

Visions are best guided by questions that trigger creativity and enable people to move beyond short-term tasks to discuss longer-term aspirations. Such questions or statements can include:

- What kind of world are our actions creating? Is this the world we want to live in? If not, what would we like to change?
- Where do we want to be in 20 years from now?
- If I could have my ideal world now, I would show…."

The vision could also consider sustainability by reviewing its components. Sustainability Assessment includes a list of dimensions that represent components of sustainability. This framework of dimensions can help prompt the development of a vision but should not limit the discussion. Using the dimensions during the visioning process can help guide the process by giving some specific areas around which to have discussions and elaborate the vision. Use the dimensions to help ensure that broad range of topics is included, but add or leave any dimension, as needed to ensure the vision is described well. The framework of dimensions and some possible elements are listed in A37.

A37. Possible Elements of the Ten Dimensions

- *Health and population*: physical and mental health, disease, mortality, fertility, population growth.
- *Wealth*: the economy, income, material goods, infrastructure, basic needs for food, water, clothing and shelter.
- *Knowledge and culture*: education, state of knowledge about people and the ecosystem, communication, systems of belief and expression.
- *Community*: rights and freedoms, governance, institutions, peace, crime, civil order.
- *Equity*: distribution of benefits *and* burdens between males and females and among households, ethnic groups and other social divisions.
- *Land*: the diversity and quality of land ecosystems including their modification, conversion, and degradation.
- *Water*: the diversity and quality of inland water and marine ecosystems; modification by dams, embankments, pollution, and water withdrawal.
- *Air*: local air quality and the global atmosphere.
- *Species and populations*: status of wild species and wild and domesticated (crop and livestock) populations.
- *Resource use*: energy and materials, waste generation and disposal, recycling; resource sectors such as agriculture, fisheries, timber, mining, and hunting.

Define Goals that Summarize the Vision

Formulating the goal is the first step towards enabling participants to arrive at an operational and measurable definition of sustainable development. A goal sets out a standard of achievement, however general it might appear at this level. Goals remind participants of their vision and provide the basis for deciding what the assessment will measure. A key feature of IUCN's Sustainability Assessment Method is the equal treatment of people and the ecosystem. Operationally, this means that goals are identified for both. The purpose of separating the two subsystems is to highlight the need to balance both aspects. In general, the goal of sustainable development is to improve and maintain people's wellbeing and the ecosystem. We cannot do that if one is being valued more than the other is.

Goals are needed for the system as a whole and for people and the ecosystem, and can be simple statements, for example (see A38):

- *System* goal: human and ecosystem wellbeing improved and maintained.
- *Human* goal: human wellbeing improved and maintained.
- *Ecosystem* goal: ecosystem wellbeing restored and maintained.

A38. Example of Goals from Zimuto Sustainability Assessment (see B6)

Participants in a village assessment in Zimuto communal land area, Zimbabwe, defined their goals as follows:

- System goal: a secure and harmonious community in a productive and diverse ecosystem.
- Human goal: secure livelihoods and strong communities.
- Ecosystem goal: a more productive ecosystem with its biodiversity restored and maintained.

The process of developing a vision and goals recognizes that there are always going to be competing interests and organizations with differing goals. This process is one of reflection and negotiation – and allows participants with different stakes to negotiate a commonly held vision of the future in a positive and encouraging environment. The key to the process is to see how the views of each individual or organization can contribute to the overall vision of sustainability.

Record Decisions and Prepare Base Maps

It is important to record the decisions made regarding focal level, differentiation level and goals, for the benefit of participants and others that could learn from the assessment. The agreed upon vision, and any proposed alternatives, will be recorded, as well as the process by which the decisions were made and the vision formulated. Information about which group was involved, what they did, and when they did it should also be included in the narrative.

Participants can begin preparing the base maps needed to locate the indicator values that are calculated in Stage 5. This involves deciding which map scale to use and the level of detail that will communicate the information without excessive investments of resources.

The content of a base map varies with the nature of the assessment. Each will be placed on the map like layers that can then be assessed together. Four types of information are usually required:

- Administrative boundaries of focal and differentiation levels. If the focal level is country and the differentiation level is the province, then the layer should show the boundaries of the provinces. If the focal level is the district and the other level is the village, the maps should show the outlines of the villages (see B5).
- Human settlements and other infrastructure.
- Drainage basins and aquatic features.
- Vegetation formations or other ecosystem or habitat units.

If ecological and hydrological units are being used as additional differentiation levels besides administrative units, they will need to be placed on the map as well. The layer of drainage basins and aquatic features will serve as the hydrological layer of information. The ecological layer may follow agroecological zones or an ecoregional classification

different from a map of vegetation. In this case, the ecological layer would warrant a map layer of its own.

Stage 3. Clarify Dimensions, Identify Elements and Objectives

Stage	Narrative	Measurement	Mapping
Identify elements and objectives	Describe elements and an objective for each element, and explain why they were chosen	Compile a meta-database (sources of information on each element), identify who knows or has access to what information	Identify sources of mapped data for each element

The vision developed in Stage 2 is, of course, not detailed enough to use for measuring performance towards sustainable development. It has to be broken down into smaller parts that can be measured, discussed, and therefore assessed more directly. The first step of sub-dividing the vision involves identifying dimensions and elements.

Elements are key subjects or concerns, features of the ecosystem or society that must be considered in order to achieve an adequate sense of their condition. These elements are formulated in general terms: 'livelihood opportunities', 'formal education', 'status of women', 'soil quality', 'availability of water supply', 'crop biodiversity'. Elements and objectives help make the vision and goals more specific, by identifying the specific aspects of sustainability that are most crucial to the area in question. Elements and objectives also provide a framework for indicators, so that it can become clearer how each contributes to overall sustainability.

The selection of elements and sub-elements is one of the most important parts of an assessment. Elements determine what the assessment will measure, and the choice of elements therefore directs the assessment's conclusions. If elements that are widely recognized as important for sustainable development are omitted, then the usefulness, and credibility of the assessment will suffer. The challenge for participants during assessment is to agree on a representative number of elements that together capture the essentials of ecosystem wellbeing, human wellbeing, and the nature of their interaction within the system being assessed. So inevitably the list of elements will be highly context-specific.

Within the set of 10 dimensions recommended for a Sustainability Assessment (see A15 on page 18), there is plenty of scope for users to define elements that best represent their purpose, interests and circumstances. Each dimension should be represented by an element or set of elements (and perhaps sub-elements) that give anyone an adequate sense of the condition of that dimension. Elements are grouped into a core set of dimensions. Dimensions can be thought of as conceptual boxes used for organizing elements that can accommodate most of the concerns of most societies. A3 and A4 (pages 3 and 4) display the set of dimensions and examples of elements. The suggested list of dimensions is intended to ensure that attention is paid to all main themes within both subsystems. The dimensions have been chosen to provide a common framework

for a wide range of assessments from national Agenda 21 reports, through thematic assessments such as a biodiversity assessment, to local and project-based assessments.

The IUCN Sustainability Assessment Method has been designed as an integrated and comprehensive system assessment. However, the basic method also functions effectively for a partial analysis. The main assessment would aim to cover all dimensions, as in the case of a Regional Assessment in Eastern Africa, for example, carried out by regional and national partnerships of organizations and individuals. A thematic or sectoral assessment would cover selected dimensions, for example a water-focused assessment in a dry district. Some organizations with limited mandates have opted to use the method for a thematic assessment that may consider only one or two dimensions, such as water resources or biodiversity. However, this will, of course, no longer provide an overview of wellbeing but only an analysis of that theme or sector.

A39. Clarifying Dimensions

The framework of 10 proposed dimensions emerged from considerable testing at IUCN. It is believed to be inclusive enough to cover a broad range of elements essential to sustainable development. However, users should confirm this for themselves.

Changing the number of dimensions from five per human and ecosystem subsystems has implications for how indicators are aggregated.

Users may want to create new dimensions in two instances:

- If the assessment is being carried out at a very small scale – community or lower – then certain dimensions may not be applicable or data may not be available. It may be necessary to drop a dimension from the assessment.
- A certain dimension may be so critical to the area in question that it should be broken into two dimensions, so as to be assessed adequately.

Participants should be prepared to clarify dimensions once elements have been chosen. In many cases, this is simply a matter of confirming that the elements identified really do fit into the suggested dimensions. If this is not the case, a new dimension could be proposed, so long as the decision and rationale are well documented.

In some cases, participants may choose to cluster elements themselves. Dimensions are simply clusters of similar elements. The proposed dimensions are thought to cover the broadest range of elements that may be relevant to any assessment, and the elements are chose to represent those dimensions fully. If participants choose to cluster elements themselves, they must also be careful to ensure that dimensions are well represented by their chosen elements. This may take some extra time, but is well worthwhile to ensure the assessment is as complete as possible.

It is also possible to identify the clusters or dimensions first if there is broad consensus in the group about what is most important to the assessment. Similarly, it will be necessary to ensure that the chosen dimensions are adequately represented by the chosen elements and also to judge whether more dimensions are required to adequately describe the system.

If elements are too broad to measure directly, then they will need to be divided into sub-elements. But this is not always necessary. Just as goals are defined for the system and for the subsystems of people and ecosystem, more specific objectives are defined for

the elements and sub-elements. A40 gives examples of dimensions, elements and sub-elements and their corresponding objectives.

A40: Examples of Dimensions, (Sub)elements, and Objectives (in italics).

Level	*Ecosystem example*	*Human example*
DIMENSION	Species and populations: *Minimal loss of species diversity; maintenance of as much population diversity as possible*	Wealth: *A decent standard of living and a strong and self-reliant national economy*
ELEMENTS	Species diversity: *Minimal loss of species diversity*	Household economies: *A decent standard of living*
sub-elements	[not necessary]	Food supply: *Sufficient food for everyone*

Whereas participants may choose to follow the suggested dimensions – and therefore may not need to discuss these – the participants in each assessment will always need to choose the elements and sub-elements relevant for them. In this stage, participants tend to produce lists of problems and concerns and use these as the basis for '(sub)elements'. But what is going right and what is desired is just as important as what is going wrong. Also, the elements and sub-elements are meant to be categories (such as 'health'), not specific concerns that would go under such categories (such as 'incidence of malaria'). That is why the elements are worded in neutral terms.

One way of identifying elements is to ask, "What do we need to know about each dimension to get an adequate sense of its condition?" The answers can then be grouped into categories of topics. For example, a good score on the wealth dimension calls for people to have material security and for the societal economy (the economy of the focal level) to be strong. That is why household economies and national economy were identified in pilot projects as the two wealth elements. Here household economies include food sufficiency, shelter, basic services (water and sanitation), and income.

Distinguishing between an 'element' or a 'sub-element' might seem confusing. If there is a logical grouping of elements, however, they can probably be redefined as sub-elements and placed under a single element heading. It is certainly preferable to group sub-elements wherever possible.

If an element is not as important as other elements in that dimension, maybe it should be treated as a sub-element. If the element is too broad in scope to measure directly, then sub-elements need to be identified. If it is possible to identify an indicator (a representative, measurable aspect) of an element, then it is unnecessary to identify a sub-element. It is impossible to measure 'household economies', but the main components – food sufficiency, shelter, income, etc. – are measurable and serve as sub-elements.

Understanding the Wealth and Resource Use Dimensions

A common question for those first trying their hand at Sustainability Assessment is why should Resource Use be characterized as a dimension of the ecosystem, rather than as part of Wealth, a human dimension?

Elements that contribute to the wellbeing of people, that is resources flowing from the ecosystem to people, *are* recorded under the Wealth dimension. However, pressures that people exert on the ecosystem, such as logging, are recorded under Resource Use. So 'income from timber' is recorded under people (wealth) and 'pressure on forests from logging' is recorded under ecosystem (resource use). Another example involves 'food'. Whether people have sufficient food is a human element. Whether food production leads to over-fishing is an ecosystem element.

For purposes of the assessment, these interactions can be recorded only under one subsystem. Placing them under both subsystems would lead to double counting and skewed assessment results.

Resource uses are the main source of human pressure on the ecosystem. So resource use indicators can warn of impending changes in the condition of the ecosystem. Measurements of ecosystem conditions are more difficult to obtain than are measurements of pressures from resource use. The state of the environment is likely to look better than it actually is if we do not include resource use indicators. In addition, resource use indicators can be designed to show pressure on the global ecosystem as well as pressure on the local ecosystem, for example: by factoring in imports. Most of the indicators of the other dimensions – land, water, air, species and populations – measure the state of the local ecosystem alone.

Identify Objectives

Objectives are the goals specific to the elements. Objectives should be formulated once elements and sub-elements are clear and have been allocated to dimensions from the suggested framework or have been clustered into dimensions formulated by the assessment participants. The objectives of the elements are more specific than the goals of each dimension. The objectives relate a desired state of each particular element back to the more general vision of sustainability. In fact, it is helpful to think of objectives as specific aspects of the vision. If the goal is 'improved human and ecosystem wellbeing', the question to ask in setting objectives is: what might this imply for an element of 'air quality?'

The objectives form a logical link in a chain of argument from the goals for people and the ecosystem to the performance criteria (standards of achievement) for each element. For example, ecosystem wellbeing is restored and maintained (ecosystem goal) by maintenance of as much genetic diversity as possible (species and populations objective) through minimal loss of species diversity (species diversity objective) which is defined in the performance criteria for the threatened species indicator.

Defining objectives can be very helpful in sorting out elements and sub-elements, and obliging participants to be clear about why the element or sub-element has been

included and what it covers. The objective also helps elaborate on the vision, but defining the intent of the elements, and how they relate to that vision.

At this stage, some confusion might arise as to how concrete the objective should be. Project staff might tend to formulate objectives in terms of concrete activities, as they are used to operating at that level of specificity. However, element objectives are stated in more general terms than project objectives and relate to the overall system vision or goal. Element objectives describe how that element contributes to the vision. Similar to goals, a simple question can guide the formulation of element objectives: "*How would you like to see the state of this element in 20 years' time?*," or "*Twenty years from now, we want this element to be …"*

The truly iterative nature of the IUCN Sustainability Assessment Method emerges here. It is difficult to formulate clear objectives for elements at the first attempt. In the next stage – that of deciding performance criteria – participants will often realize the inadequacy of the element objectives that they have set and will need to return to the element objectives before returning to the criteria formulation. Several cycles may be needed before the objectives are clear enough to formulate indicators and performance criteria.

For future reference and transparency, it is important to explain the reasons for choosing the elements, sub-elements and objectives, and to document the explanation in a narrative. It is also helpful to record the process by which the decisions were made: who was involved, what they did, and when they did it.

Compile a Meta-Database

A meta-database is a compilation of information on data. This involves identifying sources of information and mapped data on each element, for focal and differentiation levels. The meta-database helps users choose indicators in the next stage, by showing which indicators are feasible.

A meta-database provides information on the availability of data. This meta-database is compiled from answers to questions, on each element, about data collection, storage and access and information products for each unit at the differentiation level. To compile a meta-database on data availability in Pakistan, for example, one would have to note, for each province, the availability of data for each element. These questions are asked for each element:

Data collection

- **What** data? What is measured? In what units? What are the standards for precision and accuracy?
- **Where**? What are the spatial units? Where are they? Are the spatial units mapped? If so, are the maps paper or digital or both? If digital in what format?
- **How**? What is the means of data collection?
- **When**? What are the temporal units? When are the measurements taken? How often?
- **Who**? Who is responsible for collecting the data?

Data storage

- **What** data? Are the data stored in raw form (as collected) or processed or both? If processed, in what ways?
- **Where** is the data stored?
- **How**? Paper or electronic database or both? If electronic in what format?
- **Who**? Who is responsible for storing the data?

Data access

- **How**? How can the data be obtained? What restrictions are there (if any)? What charges are there (if any)?
- **Who**? Who is responsible for providing access to the data?

Information products

- **What**? What information products are produced from the data (usually by the organization responsible for data storage or data access)?
- **When**? Are the information products produced regularly or occasionally? If regularly, when?
- **Who**? Who produces the information products?

Most indicator initiatives proceed as though data is always easy and inexpensive to obtain, without ever analysing this belief. Creating a meta-database will provide most of the information to be able to analyse data requirements for each element at the indicator stage (see Stage 6). This database will also be very useful after indicators have been drafted, to assess whether data exists and whether or not these indicators are feasible.

1. What statistics are compiled regularly for the chosen spatial level, at what intervals, what are the topics they cover, and where are they held?
2. What statistics are compiled occasionally, when, what are the topics they cover, and where are they held?
3. What other data are available in electronic databases and published reports, what topics do they cover, and how they can be obtained?
4. What data are available in unpublished reports and files, what topics do they cover, how they can be obtained, and how big a task it would be to get useful information from them?
5. What other information sources exist, such as expert groups or key individuals (elders, healers, traditional leaders)?

Stage 4. Choose Indicators and Performance Criteria

Stage	Narrative	Measurement	Mapping
Choose indicators and performance criteria	Explain and justify indicators and performance criteria	• Choose, define and review indicators • Decide performance criteria	No activity

Choose Indicators

It is impossible to measure directly the state of the system, the condition of people, or condition of an ecosystem. Therefore, it is necessary to separate these components into measurable parts, of which the indicators of the sub-elements are the smallest part. Systematically dividing larger components – the elements – into more specific indicators ensures that assessment users will understand the importance of the indicators, how well they represent key features of each subsystem (including elements they cover poorly or not at all). Elements that are not represented by indicators due to inadequate information will be easily identified in this process. The hierarchy of dimensions and indicators helps create an orderly and logical structure for combining indicators again, in the next stage, to provide an overall judgement of the system (see Stage 6).

Indicators are measurable and representative aspects of an element (A41). Indicators can reveal insights about an aspect of the system being assessed. They can make complex phenomena quantifiable so that communication about the phenomena is made easier. Indicators can serve as generalizations at the global level when widespread consensus exists, or can be representative of highly context-specific situations. In the case of Sustainability Assessments, indicators will often be context-specific, as they need to reflect the dimensions, elements, and sub-elements that are pertinent to the system being assessed.

Indicators are evaluated by four criteria – measurability, representativeness, reliability and feasibility – to help decide whether they will be helpful, need adjustment or need substitution. A44 offers guidance on making choices.

The need for a manageable, and therefore small, set of indicators makes it especially important to ensure they are of high quality. To be useful, indicators must also be *reliable* and *feasible*. At least one indicator should be chosen for each sub-element (or element, if there is no sub-element). If the indicator is reasonably representative and fulfils the other criteria (it is measurable, reliable, and feasible), then it will be enough on its own. If it is insufficiently representative or its reliability is suspect, then additional indicators will be needed.

To be useful, indicators need to be defined clearly. Undefined or ill-defined indicators are virtually impossible to use. It is difficult to communicate effectively when indicators can be interpreted in too many different ways. It is difficult to draw up a definition that does not leave room for different interpretations.

A simple check of whether or not an indicator is *measurable* is to try to express it in quantitative rather than vague terms. An example of vague terms would be: "threatened species" or "people without enough food." Quantitative terms can be expressed as a direct physical measurement or as opinion poll results. Opinion polls are acceptable as long as they are administered in a sound manner, are direct measures of what is being measured and are representative of the element. Each of the indicators in A41 is expressed in a way that makes clear what is being measured. The more precisely the indicator can be defined, the less likely misunderstanding about it will occur between the people involved in the assessment.

A41. Examples of Indicators

Element	Indicator
Water quality	Faecal coliforms per 100 ml water
Species diversity	Threatened species in a group as a percentage of total species in that group
Health	Life expectancy at birth (years)
Food supply	Percentage of the population that is undernourished

An indicator is fully *representative* if it covers the most important aspects of the element or sub-element concerned, and demonstrates trends over time and differences between places and groups of people.

An indicator is more likely to be *reliable* if it is well founded, accurate, measured in a standardized way with sound and consistent sampling procedures, and directly reflects the objective concerned. 'Well-founded' means that its relationship to the element it represents is well established, scientifically valid, or is a defensible and testable hypothesis. For example, stunting (low height-for-age) in children is a well-founded indicator of lack of food, since many studies have demonstrated the relationship.

A42. Reliable Indicators and Pressure-State-(Impact)-Response Models

Many indicator models use the Pressure-State-(Impact)-Response model to identify and organize indicators. The Sustainability Assessment Method uses '*elements'*, which are broad aspects of society that follow from a shared vision of sustainability and a set of dimensions. PS(I)R models start with '*problems'* – air pollution, deforestation, biodiversity loss – and the language used reflects that distinction.

PS(I)R uses three key types of indicators (see A43) – one covering the element's state (S), one showing pressures (P) and one showing how society is responding to the problem (R). For example, state indicators on air pollution would seek to measure and communicate contaminants such as suspended particulate matter, ground-level ozone and carbon monoxide. The pressure indicators would try to reveal the source of these pollutants. The response indicators show how society responds to the problem, either through money spent, international treaties signed or other measures.

Sustainability Assessment primarily uses 'state' indicators, because in most cases, they are the most reliable measure of an element. Pressure indicators are useful in instances where measuring the pressure that one area is having on another is preferable – particularly cross-border pollution, long-range transport of air or water pollutants and impacts on the global atmosphere. In this case, pressure indicators oblige users in a certain area to acknowledge the effect that they are having on other areas, and the global ecosystem, by setting tough performance standards for themselves.

The use of response indicators is not encouraged in Sustainability Assessments, as it is often hard to link the state of an element with the responses society is undertaking to alleviate the problem. A problem also cannot always be sufficiently representative of an element. It is easy to imagine policies on which much money has been spent but achieving little change. This method encourages users to measure the state of an element more directly.

A43. Direct and indirect indicators linked to Pressure-State-(Impact)-Response models. Lines in italics show examples from health (upper line) and fisheries (lower line). In general, the more direct the indicator, the more useful it is for measuring the achievement of an objective. Directness increases from right (procedures) to left (states), as does the suitability of substitute indicators when state indicators are not available.

RESULTS		*RESPONSES*		
states	**pressures**	**outputs**	**inputs**	**procedures**
actual conditions	factors that change conditions	actions taken to implement procedures	provisions for implementing procedures	policies, plans, projects, etc.
life expectancy at birth	*diseases, accidents*	*more hospital beds*	*health expenditure*	*national health strategy*
size of fish stocks	*fishing effort, pollution*	*fishing regulations*	*research on fish stocks*	*fishery policy*

most direct ◄——— directness of indicator ———► least direct

most suitable ◄——— suitability as a substitute when state indicator unavailable ———► least suitable

An indicator is *feasible* if it requires data that are readily available or obtainable at reasonable cost and effort. Such data will be available in a variety of forms and from a variety of sources. To determine feasibility, there is a crucial distinction is between: (a) data that are already collected as a matter of course and are available as maps, statistics, or both; and (b) uncollected data. The meta-database prepared in earlier stages should be able to show whether the data are already collected and provide additional information on collection, storage and access.

A44. What to Do with Indicators in Each of the Five Quality Classes

Indicator quality class	**What to do with the indicator**
The indicator is measurable, representative, reliable, and feasible.	Fine, use it.
The indicator is measurable, reliable, and feasible, but not sufficiently representative.	Use it and try to find one or more additional indicators until you feel the sub-element or element is adequately represented.
The indicator is measurable, representative, and feasible, but not very reliable.	Is it reliable enough to use, if everyone is made aware of its flaws? If so, use it and try to find one or more additional indicators that together could produce a more reliable picture. If not, drop it, and try to find a substitute.
The indicator is measurable and feasible but not sufficiently representative or very reliable.	Is it reliable enough to use, if everyone is made aware of its flaws? If so, use it and try to find one or more additional indicators that together could produce a more reliable picture. If not, drop it, and try to find a substitute. In any case, since the indicator has two significant problems, be more inclined to drop it than keep it.
The indicator is feasible, but not measurable, or not representative, or not reliable.	Forget about it.
The indicator is measurable, representative, and reliable, but not feasible.	Can another indicator or set of indicators represent the (sub) element reasonably? If so, drop the one first suggested. If not, re-examine the indicator's feasibility. Three may be a more creative and cost-effective way of finding the required data.

For data that are not being collected at present, it is necessary to determine:

- How, when and by whom will the data be collected? What are the standards for the precision and accuracy of records, and frequency of updates?
- Where, how and by whom the data will be stored?
- Who should have access to the data, how, and at what charge (if any)?
- What are the costs of collection and management and how will the costs be covered?

Answering these questions will make it possible to decide whether the costs of getting the data and maintaining the indicator are reasonable. Referring to the meta-database can help at this stage.

If no indicator that adequately meets the criteria can be found for a (sub)element, then the sub-element or element should be excluded from the assessment. In such cases, it

is important to point out in the narrative that the (sub)element is considered to be important but that it cannot be covered (see the case studies, Sections B5, B6 and B7). The indicator will not appear in the measurement or mapping, but it will appear in the narrative.

Sustainability Assessment does not preclude using qualitative indicators (see A45). It is always possible to measure qualitative aspects of sustainable development – people have been doing this for many years through opinion polls, attitude surveys and other instruments. In many cases, qualitative indicators can offer scientifically rigorous insights into important questions. The rules for qualitative indicators are exactly the same as for quantitative indicators – they must be measurable, representative, reliable and feasible.

A45. Good-Quality Qualitative Indicators

Characteristic	Description
Measurable	A measurable qualitative indicator simply means that the result can be expressed as a number. *Attitude of women to a certain policy*, could be expressed as the number of women in support of the policy.
Representative	Qualitative indicators must follow exactly the same rules as quantitative indicators on representativeness – and indicator is representative if it covers the most important aspects of the element, can demonstrate changes over time and highlight differences between places and groups of people. A qualitative indicator can easily be combined with a quantitative indicator.
Reliable	For qualitative indicators, reliability is particularly important. The indicator will be reliable if it is well founded, accurate, measured in a standardized way (the same time every time) and with a proper sampling procedure. The most reliable indicators measure the state of an element directly, rather than pressures on that element, or societal responses to a perceived problem derived from the element.
Feasible	Surveys can be quite expensive to administer, and they almost always must be designed specifically for the assessment. This should be kept in mind.

Indicators and Performance Criteria as a Reflective Process

Many participants in a Sustainability Assessment will have neither the time, resources nor data to undertake an assessment that features a high-degree of data handling. While this method was developed with the intention that participants would choose indicators and performance criteria, collect data, and then aggregate indicators to show the overall performance of human and ecosystem wellbeing, there is nothing preventing users from engaging in these steps simply as a reflective exercise.

Applying Sustainability Assessment without resorting to data gathering becomes important as a thought-stimulating exercise although the information produced is based on estimates rather than measured data. Users still consider the wellbeing of people and the ecosystem together; choose elements and objectives in a systematic manner, according to the framework of dimensions or their own dimensions. The benefits of

undertaking an assessment – a more complete view of sustainability, discussion of key elements, results that can be used for planning, evaluation or awareness raising – are still available to users provided they are willing to engage in meaningful discourse.

Discussing indicators and performance criteria, even if data will not be collected, can be an exercise to deepen the assessment process. Once a vision has been articulated, elements and objectives identified and dimensions clarified, users can deepen this understanding by discussing the specifics of indicators and performance criteria. Indicators are measurable and representative aspects of an element – this does not change in a reflective exercise. Performance criteria help users interpret indicator measurements, and relate the indicators back to the objectives, goals and vision in a highly specific manner. As reflective exercises, they force users to engage with the question of sustainability, by answering two key questions: How will we know if the situation is changing (what would be measured)? How do we interpret that change?

Users can follow the guidance in this Stage of the Resource Kit as if they are undertaking a full-scale Sustainability Assessment. Keep in mind, though, that the discussion will be bound by the knowledge of the people present during the discussions. An indicator, in this instance, is only feasible if someone in the room can give an estimate in an informed manner and the estimate can be interpreted in a way that increases understanding. It is not helpful to choose an indicator that nobody can estimate, or for which the basic understanding is lacking. A group of users reflecting on air quality should not choose an indicator such as "ground-level ozone" if nobody has an idea what ground-level ozone is, how much is bad or what the measurement might be in their area.

If users are more ambitious, then once indicators are chosen and performance criteria identified, estimates using the Barometer performance scale could be derived and recorded. This will allow users to aggregate indicators into elements and elements into dimensions. Users will be able to benefit from the power of Sustainability Assessment by discussing specific details (indicators) and more general themes (dimensions) in a systematic manner. In lieu of precise data, it will be critical to maintain awareness that precision is not the main advantage gained by following the Sustainability Assessment Method. What is gained is a systematic procedure to ponder on system-specific aspects of sustainability.

Decide on Performance Criteria

Performance criteria are specific standards of achievement for each indicator selected. Performance criteria define what is considered the 'best' performance level, which represents the full achievement of the objective. Once this has been determined, the performance criteria then help define various levels of distance from that ideal from the worst level upwards as a proportion of an indicator's movement toward the ideal. Performance criteria help users of indicators to interpret the measurements according to the objectives of each element by specifying exactly what is meant by good and bad results.

In Sustainability Assessments performance criteria help translate the goals and objectives into more concrete levels of measurable performance. Performance criteria

also provide the basis for putting indicator results on a performance scale, so that these results can be combined.

Combining different indicators requires combining units that are not similar, such as apples and oranges. To do this successfully requires that a measure be found that does not distort their unique qualities. One option is to convert the indicator measurements to a common unit, such as fruit. A better option for our purposes is to put the indicators on a performance scale.

A *performance* scale measures how good an orange is at being an orange and how good an apple is as an apple on the criteria we have chosen. From these results, one can then calculate how well 'fruit' meets the purpose that has been assigned. This result is worded in terms of the difference between an average level of performance of apples/oranges and the actual performance of the apple/orange being assessed, as recorded by measuring the indicator. On a 0-100 scale, best performance would be 100 and worst 0. A given apple or orange would be assigned a score according to how it rated in relation to 'best' and 'worst.'

Note that performance criteria, or the definitions of best and worst performance, for apples and oranges could be very different. However, since the scores of apples and oranges are calculated in the same way on the same scale, in terms of a percentage, these scores can be combined. The conversion to a percentage that describes the performance is a critical feature of the Sustainability Assessment method.

A performance scale (see A46) allows use of whatever measure or yardstick is most appropriate to the element concerned. Income and value added are measured in money. But, health is measured in disease and death rates; employment is measured in jobs, species diversity in percentages of threatened species, land degradation as erosion rates, social cohesion in terms of participation in community groups, and so forth. Distortion is negligible because the original units in which the indicator is measured are maintained.

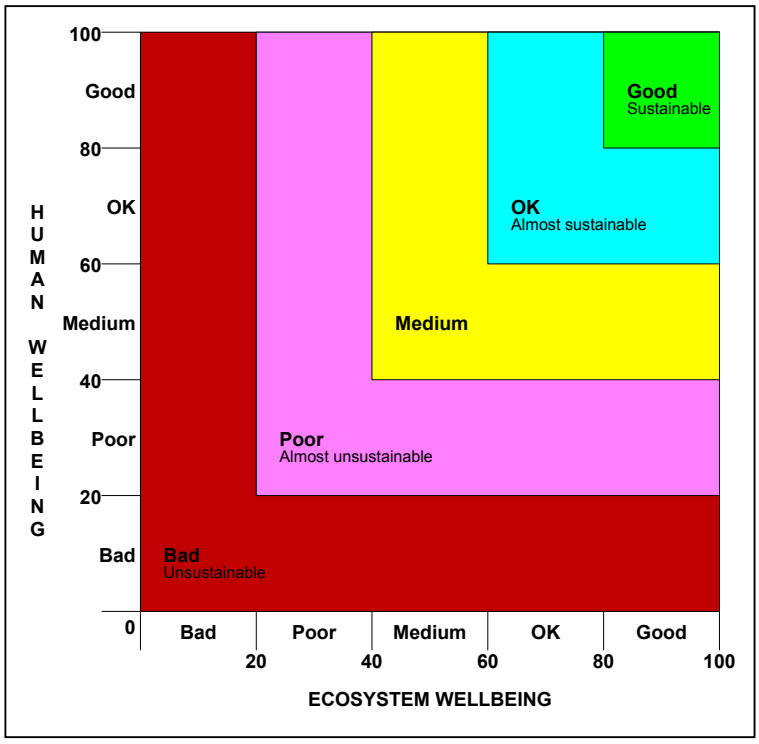
Setting performance criteria means defining what is a 'good' and 'bad' performance for all indicators, and often 'OK' and 'poor' performance as well. This is often a challenging and thought-provoking task, and may take a good deal of discussion. Naturally, making judgements is necessary throughout any assessment, from formulating a vision to choosing indicators. All of this is beneficial. Discussing key elements and their indicators, and deciding on desirable and unacceptable performance for each indicator, is essential for building consensus on the nature and relationship of human and ecosystem wellbeing.

Although other performance scales exist, Sustainability Assessment uses the Barometer of Sustainability (A47). The Barometer is the only performance scale designed to measure human and ecosystem wellbeing together and without elevating the importance of one above that of the other.

A46. Performance Bands of the Barometer of Sustainability

Band	Top point on scale	Definition
Good	100	Desirable performance, objective fully met
OK	80	Acceptable performance, objective almost or barely met
Medium	60	Neutral or transitional performance
Poor	40	Undesirable performance
Bad	20	Unacceptable performance
Base	0	Base of scale

A47. The Barometer of Sustainability



The Barometer's 0-100 scale is divided into five bands of 20 points each. The bands correspond to performance criteria defined for each indicator, and are therefore a clear and direct method of controlling how scores are distributed. By defining as precisely as possible what each of the Barometer's bands represents, assessment users will avoid unnecessary confusion.

A48. Combining Indicators and Common Units

Indicators can start to explain the larger picture when they are combined using common units. 'Common units' are either physical units or monetary units. Physical units are appropriate for a limited range of elements. Materials can be combined on the basis of their weight, but this does not account for the different impacts of materials. Pollutants with similar effects can be combined according to their potential for that effect – such as global warming, ozone depletion, acidification, or toxicity – but pollutants with different effects cannot be combined in this way. Uses of energy and renewable resources can be converted into the area of productive land and sea required to supply the resources and absorb carbon dioxide from fossil fuels but area is not a suitable unit for measuring air quality or genetic diversity (Adriaanse 1993; Weight: Adriaanse *et al.* 1997; Area and Ecological Footprint: Wackernagel and Rees 1996, Wackernagel *et al.* 1997). No single physical unit has been found that could combine all indicators of ecosystem wellbeing, let alone human wellbeing.

'Money' is standard in all economic accounts, from the System of National Accounts to Genuine Saving and the Genuine Progress Indicator. It is also used in some environmental assessments, such as the cost of remediation (COR) index, a measure of the cost of moving from the present state of the environment to a more desirable level sometime in the future (Harvard University 1996). However, money has serious weaknesses as a common unit. It reflects the market price of things like apples and oranges, but cannot be used to measure their taste, nutritional content or cultural value. It can express the value given to things that are traded in the market but it is difficult to apply to anything that is not traded. The less tradable the item, the greater the distortion created when working with 'money' as the common unit.

Use of common units also causes some special problems with regard to transparency. Valuation, common units and complex calculations obscure many of the judgements about good and bad and make interpretation of these indicators difficult to all but a few specialists who have taken the time to learn how the indicators are composed. This precludes the use of such approaches in highly participatory approaches, since most people do not have the time or interest to earn the advanced degrees in economics, environmental biology or other disciplines required to interpret such work.

Deciding on performance criteria involves defining the top of each band (the best level of performance) and the base of the scale (the worst level of performance). Deciding on the numeric value for each of the bands is a matter of judgement by the participants in a Sustainability Assessment. They can use any of the following standards for guidance:

1. The range of recent, current and expected performance of that element/indicator.
2. The objective of the element concerned. For example, if the objective of your health element is a "long and healthy life", and pick 'life expectancy' as the indicator and specify a 'good' band with a high score (80 years or higher!).
3. At least one of the following is used to set one or more of the bands:
   A. Estimated sustainable rate. For example, a sustainable rate of timber felling would be less than 100% of net annual increment.
   B. Estimated background rate ('natural' or 'normal' performance). For example, the background rate of animal extinctions is estimated to be less than 0.01% of species per century. A desirable percentage of threatened species could be defined as not more than 100 times that rate.

C. Other threshold. For example, countries have increasing difficulty supporting external debt when debt service payments are above 20% of exports of goods and services.

D. An international (or national) standard. For example, a UN standard for water quality is less than 30 milligrammes of nitrogen per litre of water.

E. An international (or national) target. For example, a UN target for education is 100% primary education by 2015.

F. Expert opinion. For example, Transparency International's Corruption Perceptions Index.

G. A derivation from a closely linked or related indicator. For example, because there is no specific UN target, the performance criteria for secondary education should be a less stringent version of those for primary education.

H. The judgement of the participants. If none of the above factors is available, the choice of performance criteria is entirely up the judgement of the participants. This judgement may be based on research, experience or consensus of the group.

The three steps of deciding on performance criteria, selecting a standard and scaling the indicators, must be carried out for each indicator. Selecting the standards (a-g) to follow will depend on circumstances. Check which exist and which is most likely to be most accurate: (a) to (c) are scientific standards, (d) and (e) are consensus-based while (f) and (g) are more judgement-based. A descriptive narrative will help explain the choice of standards for determining performance criteria for each indicator to others who were not part of the decision-making process.

Narrative and Performance Criteria

Narrative is particularly important at this stage of Sustainability Assessment, as the complexity and judgement-value based nature of selecting indicators and performance criteria may be difficult for others to understand. Participants themselves may need to refer to this part of the narrative regularly to remind themselves of the basis of their choices, and to revise these choices.

It is useful to also document the process of selecting indicators and performance criteria, particularly how the decisions were made, what compromises (if any) were observed, and to which general criteria (refer to above) the final decision used.

Stage 5. Gather Data and Map Indicators

Stage	Narrative	Measurement	Mapping
Measure and map indicators	Draw attention to main findings and explain apparent anomalies	Measure the indicators and calculate their scores	Map the indicators

Once the indicators are chosen and necessary information identified, it is time to obtain the data to make performance calculation possible. As part of the assessment, the team needs to create a database and to make arrangements with sources of existing data to receive data regularly (see Sections B14 and B15). Where possible, monitoring systems and surveys may need to be organized for any indicators requiring data not currently collected. All data will need to be entered into the database, which should be geographically referenced to enable the data to be linked to the appropriate area and ensure correct comparison across differentiation levels.

Once the data have been obtained for an indicator, the measurements are given scores on the basis of the performance criteria. The performance criteria define the bands, while the indicator score will determine in which band a given indicator measurement will fall. For example, using the criteria given below, a life expectancy at birth of 55 years goes into the poor band because it is between 60 years (the top of the poor band) and 45 years (the top of the bad band).

A49. Indicator Scale for Life Expectancy

Band	Top point on scale	Life expectancy at birth (years)
good	100	85
OK	80	75
medium	60	70
poor	40	60
bad	20	45
base	0	25

The indicator measurement's exact position in the band is determined by calculating its score. There are two ways to determine the band position, depending on whether:

- 'best performance' is the maximum value and 'worst performance' is the minimum value. For example, life expectancy at birth for newly born.

Or:

- 'best performance' is the minimum value and 'worst performance' is the maximum value. For example, threatened animal species as a percentage of total animal species.

There are five equal bands, each with 20 units.

When *'best' is the maximum value and worst is the minimum*, the indicator score is calculated as follows:

> ([actual minus minimum] divided by [maximum minus minimum]) multiplied by 20. The result is then added to the base of the band.

For example, the life expectancy at birth of a Zimbabwean born in 1995 was 50.7 years. This would put it in the 'poor' band. The calculation is:

> 50.7 (actual) – 45 (minimum) = 5.7
> 60 (maximum) – 45 (minimum) = 15
> 5.7 ÷ 15 = 0.38
> 0.38 × 20 = 7.6
> 7.6 + 20 (base of band) = 27.6 = **28**

Scores are rounded to the nearest whole number. A score of 0.5 may be rounded down or up. The score is usually rounded conservatively: whichever produces the lower score.

Note that the base of a band is the top of the band below. When best is the maximum value and worst is the minimum, the maximum value corresponds to the top of the band, and the minimum value corresponds to the base of the band (A49).

A50. Tops and bases of bands and corresponding maximum and minimum values when best performance = maximum value and worst performance = minimum value

Band	Points on scale	Top of band =	Base of band =	Maximum value corresponds to:	Minimum value corresponds to:
Good	100-81	100	80	100	80
OK	80-61	80	60	80	60
Medium	60-41	60	40	60	40
Poor	40-21	40	20	40	20
Bad	20-1	20	0	20	0

When *best is the minimum value and worst is the maximum*, the indicator score is calculated as follows:

> ([actual minus minimum] divided by [maximum minus minimum]) multiplied by 20, then subtracted from the top of the band.

For example, the mean percentage of threatened animals in Venezuela is 3.8%, putting it in the OK band. The calculation is:

> 3.8 (actual) – 2.0 (minimum) = 1.8
> 4.0 (maximum) – 2.0 (minimum) = 2.0
> 1.8 ÷ 2.0 = 0.9
> 0.9 × 20 = 18
> 80 (top of band) – 18 = **62**

Note that when 'best' is the minimum value and 'worst' is the maximum, the *minimum* value corresponds to the top of the band, and the *maximum* value corresponds to the base of the band (A51).

A51. Tops and bases of bands and corresponding maximum and minimum values when best performance = minimum value and worst performance is the maximum value

Band	Points on scale	Top of band =	Base of band =	Maximum value corresponds to:	Minimum value corresponds to:
Good	100-81	100	80	80	100
OK	80-61	80	60	60	80
Medium	60-41	60	40	40	60
Poor	40-21	40	20	20	40
Bad	20-1	20	0	0	20

Map the Indicators and Explain Findings

Each indicator score will reflect the strengths and weaknesses of the indicator, the quality of the data, and the judgements and interpretations of participants in the assessment. It is important to document the main findings and to discuss how they are influenced by these factors. Maps will be an invaluable aid in helping analysis.

All ecosystem indicators and most human indicators can be representedspatially. Therefore maps are a highly effective way of recording, analysing and communicating how indicators vary – or stay the same – over a spatial area. Maps aid analysis by revealing patterns of performance and links among indicators. Moreover, although information can be recorded in other ways (tables, databases, etc.), the mapping of indicators is an essential part of this method because it:

- forces participants in the assessment to link the work to a real and specific place or situation;
- obliges participants to gather information about the whole area, rather than a few locations, which is essential to avoid generalizations across large geographic areas from a small number of experiences;
- highlights data gaps;
- exposes data trends and peculiarities, which then may be explored in greater depth, for example through statistical analysis;
- facilitates comparison among different situations, sites, and times;
- allows immediate consultation of the underlying data whenever necessary, using software (notably Map Maker Pro, see B18) that links maps and databases;
- is a powerful communication tool, as many people, especially villagers, understand the visual aspect of maps better than written tables or text.

However, like any communication tool, maps can be misleading, especially when data estimates have been used. Maps can imply accuracy of detail when the data is based on estimates. Maps can also obscure or generalize information, for example portraying all streams or waterways as rivers. Or the absence of features may imply they do not exist,

though it may be the data are not available or they have been intentionally left out. Maps also portray only the general situation for the differentiation level and do not allow for more detailed comparisons. For example, if the differentiation level is a province, the map will only show average figures for the provinces within the system. However differences that inevitably lie within any single province, e.g. between villages or wards, will not be revealed. This would only be possible if the assessment used the province as its focal level and identified a more specific differentiation level (see Stage 1 and Stage 2 for reminders about the choice of focal/differentiation level).

Misunderstandings can be avoided to some extent by considering whether the scale, projection, symbols, labels, colours, shading or other features of the maps are likely to be misinterpreted. Even more important than accurate map detail is ensuring that a narrative accompanies the indicators, offering an analysis of their strengths, weaknesses and implications. Such explanations of the quality of each indicator will allow users to form their own opinion about the value of the information that they see on the map.

Stage 6. Combine Indicators and Map the Indices

Stage	Narrative	Measurement	Mapping
Combine indicators and map indices	Draw attention to main findings and explain apparent anomalies	Combine the indicators into indices	Map the indices

Once indicators have been given a score they can be combined. As indicator scores are calculated in the same way using the same five-band scale, the scores can be combined into indices, or compound indicators. These scores can be combined throughout the hierarchy of elements. Indicators are combined into a sub-element index, or an element index, if there is no sub-element. Sub-elements are combined into an element index, elements into a dimension index, and dimensions into a subsystem index. There is a subsystem index for people, the Human Wellbeing Index (HWI), and another for the ecosystem, the Ecosystem Wellbeing Index (EWI).

This step is only necessary and advisable if the assessment is using data to measure the indicators. In a process-based assessment where the main goal is reflection on sustainable development, aggregating indicators without data is a difficult and perhaps unnecessary exercise. To make aggregation meaningful, an assessment requires data for all indicators of sufficient quality to be comparable. If this is not the case, then aggregation is probably not useful, as the results will be highly suspect.

If the assessment has chosen indicators and performance criteria, participants may want to make estimates for each and try to draw a general picture of sustainability – especially for each dimension – as a thought exercise. Be aware, though, that the results will likely not be accurate or reliable. Estimates will rely heavily on the expertise that is available and should be treated with considerable caution.

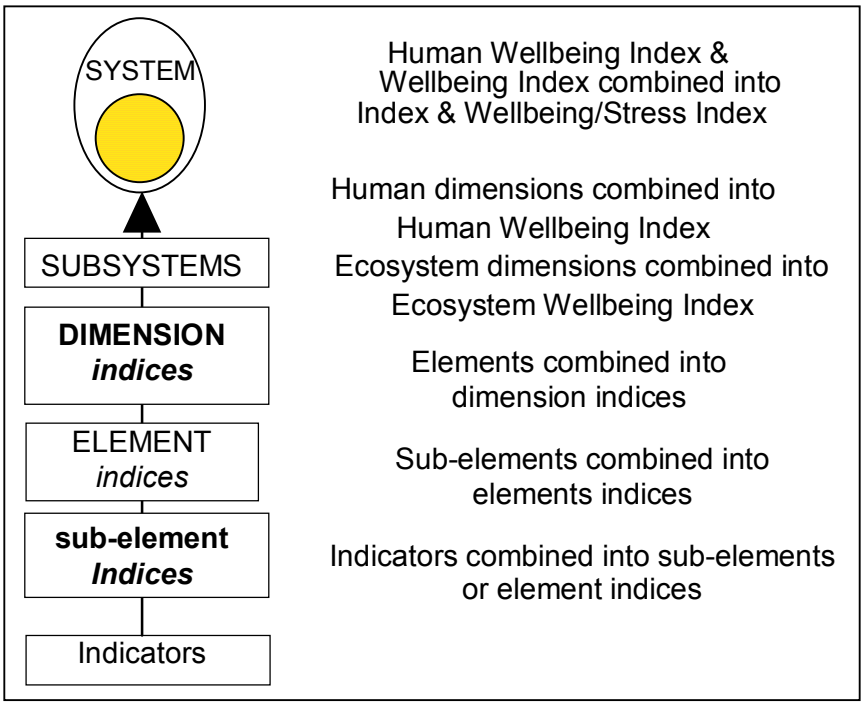
Combine Indicators into Indices

This section covers elements related to combining and weighting indicators (see A52).

Indicators, sub-elements, elements, or dimensions) are combined in one of three ways:

- ***Unweighted average:*** the elements are added and averaged. For example, if one element has a score of 70 and another has a score of 30, the combined score is 50: 70 + 30 = 100 ÷ 2 = 50.
- ***Weighted average:*** the elements are given different weights, and then added and averaged. For example, if the element with the 70 score is given a weight of 1, and the element with the 30 score is given a weight of 2, then the combined score is 43: (70 × 1) + (30 × 2) = 130 ÷ 3 = 43.3. (Scores are multiplied by their weights and then the total score is divided by the total weight. In this case a weight of 1 plus a weight of 2 makes a total weight of 3.)

- ***Veto:*** a lower score overrides a higher score. For example, the element with the 30 score would override the element with the 70 score, giving a combined score of 30.



A52. Combining indicators back up the hierarchy of elements

An *unweighted average* is used to combine elements that are considered to be roughly equal in importance or in the quality and coverage of the indicators and to offset each other. Note that good performance in one element can offset bad performance in another element. For example, in a district assessment, within the element of 'water', two indicators of 'water quality' and 'water quantity' may be considered equally significant in terms of determining the overall water situation. These two indicators contribute equally to the overall state of 'water' and are not weighted. An unweighted average is also used when it is felt to provide a more representative picture than if a veto were used. For example, the human wellbeing index and the ecosystem wellbeing index are *always* the unweighted averages of their constituent dimensions.

A *weighted average* is used to combine elements that are considered to be unequal in importance or in the quality and coverage of the indicators. The weight reflects the difference in importance or in quality and coverage. For example, the index of species diversity could be given twice the weight of the index of a species' population diversity (both within the dimension of 'species and populations') because the loss of a species is more significant than the loss of a population or genetic line.

A *veto* is used to denote that poor performance in one element cannot be offset by good performance in another. The lower score overrides the higher score. For instance, the lower of the ‘global atmosphere index’ or the ‘local air quality index’ will be taken to show that good performance in one index cannot be offset by poor performance in the other.

Averaging assumes that good performance in one dimension compensates for bad performance in the other, and vice versa. If it does not, it is assumed that the average conveys a truer sense of the dimension than would the lower score. Using the lower score implies that wellbeing requires good performance in both elements. For example, if a country's scores for land diversity and land quality are 29 and 96 respectively If the good score for land quality offset the poor score for land diversity, then taking the average (62) would be justified. But land diversity measures the conversion and modification of all land ecosystems, whereas land quality measures the degradation primarily of cultivated terrain. In this case, a veto score of 29 might be more useful.

Weighting Dimensions: A Caution

Generally, dimensions are not weighted, but there may be compelling reasons to do so, particularly if the problems of one dimension push the ecosystem or human development toward a threshold. For example, if the assessment relied completely on a single resource, then depletion of that resource would mean catastrophe for the people living there, and as such, the resource-use dimension should be weighted to reflect the situation.

Be aware of the implications of weighting dimensions. If one dimension is weighted twice as much as the others, then each of the elements and indicators in that dimension would be similarly weighted. It may be that only a couple of indicators warrant weighting, while the others do not, in which case, one should not weight the entire dimension.

The Wellbeing Index and the Wellbeing/Stress Index

The (general) Wellbeing Index (WI) can be expressed numerically as the lower portion of the Human Wellbeing Index (HWI) and the Ecosystem Wellbeing Index (EWI). However, the representation provided by the Barometer of Sustainability is more informative because it illustrates graphically the relationship between the HWI and the EWI. This relationship can hardly be expressed as a single number.

The Wellbeing/Stress Index (WSI) – the ratio of human wellbeing to ecosystem stress – is produced in two steps. First, the Ecosystem Wellbeing Index score is subtracted from 100 to convert it into an Ecosystem Stress Index. In the next step the Human Wellbeing Index is divided by the Ecosystem Stress Index. The performance criteria adopted by *The Wellbeing of Nations* for the WSI are shown in A52. A WSI of 1.0 means that ecosystem stress equals human wellbeing, and a WSI below 1.0 means the ecosystem stress exceeds human wellbeing. A higher score means more sustainability.

In the case of Mauritius (A54):

- 100 – 47 = 53 (Ecosystem Stress Index)
- 59/53 = 1.11 (Wellbeing/Stress Index).

In the case of Comoros (also A54), the situation is dramatically different. Comoros has a lower ecosystem stress index but also a much lower sustainability index due to the very low level of human system sustainability:

- 100 – 42 = 58 (Ecosystem Stress Index)

- 24/58 = 0.41 (Wellbeing/Stress Index).

A53. Performance Criteria for the Wellbeing/Stress Index (Prescott-Allen, 2001)

Band	Top point on scale	Ratio of human wellbeing to ecosystem stress
Good	100	8.0
OK	80	4.0
Medium	60	2.0
Poor	40	1.0
Bad	20	0.5
Base	0	0

A54. Southern African scores for human wellbeing, ecosystem stress, and progress toward sustainability index (human wellbeing per unit of ecosystem stress) (Prescott-Allen, 2001)

Country	Human wellbeing index	Ecosystem stress index	Human wellbeing/ ecosystem stress
Botswana	34	32	1.06
Mauritius	54	56	0.96
Namibia	34	46	0.74
South Africa	43	73	0.59
Malawi	22	38	0.58
Lesotho	24	43	0.56
Swaziland	24	46	0.52
Zimbabwe	23	45	0.51
Madagascar	24	50	0.48
Comoros	20	56	0.36
Zambia	16	57	0.28
Mozambique	11	45	0.24
Angola	8	33	0.24

Map Indices and Explain Results

As with the indicators, a map is generated for each index by linking the base map to the appropriate set of scores, so that the pattern of performance at the differentiation level is shown.

Like the indicator results, each index will reflect the strengths and weaknesses of its constituent indicators, the quality of the data, and the judgements and interpretations of participants in the assessment – including their decisions about combining procedures. In addition, the dimension indices and especially the Human Wellbeing Index, Ecosystem Wellbeing Index and Wellbeing/Stress Index will give interesting and perhaps surprising results, simply because they combine a much wider range of elements than people are used to considering together. It is important to point out the main findings, and to discuss how these and other factors influence them.

Stage 7: Review Results and Assess Implications

Stage	Narrative	Measurement	Mapping
Review results and assess implications.	Analyse performance, discuss causes and implications, and propose policies and actions	No activity	No activity, other than using maps for analysis

The effectiveness of a Sustainability Assessment is determined by what actions are planned and taken in response to the findings. Finally, the assessment's use will be measured by the difference those actions make to people's lives and the condition of the ecosystem. Thus far, the assessment process has produced indicators and indices that show existing conditions in terms of how far the actual situation is removed from the ideal, system goal or vision. This is, of course, only a snapshot. What remains to accomplish is to bridge the gap between the current situation and future vision. Reviewing the collected data is the critical link that transforms the assessment into action.

The questions and ideas below are offered as a start to the analysis. Realistically, the results of Sustainability Assessments are used as an input to other processes such as detailed surveys to fill data gaps, policy discussions, strategy reviews for projects/programmes etc. These questions, then, should be the start of a action process, rather than its defining product.

Reviewing requires:

- analysing the indicators and indices, the patterns of performance that they produce, and the data behind them;
- determining the elements and areas where improvements are most needed;
- proposing policies and actions to realise the improvements, including reviewing and revising policy, programme and project objectives and targets.

Analysis runs through these tasks and involves answering the following questions:

- What is going well in our system? What is going poorly?
- Why? What are the causes of both the strong and weak performances?
- What are we doing about it? What should we do?
- What are the consequences for the system of action/inaction?
- What are the obstacles to doing making the changes?
- What knowledge do we lack about what to do or how to do it?
- What conflicting interests exist within society?
- What external forces (such as trade barriers) are at play?
- Does what we are trying to do conflict with other objectives?
- Do we have sufficient resources?
- How can the obstacles be overcome?

What do the numbers and maps that emerge mean in relation to action priorities? Participants in a Sustainability Assessment need to be able to draw conclusions from the many discussions, the numbers and visual outputs that can lead to identifying priorities for improvement. The indicators and maps only take on meaning when their 'patterns of performance' are analysed. This takes place at various levels, for example, by:

- Comparing performance according to various dimensions and elements using the Barometer of Sustainability – for example how the health dimension compares to wealth dimension.
- Comparing the current to the future desired state – for example, how far removed current land quality is from the ideal, and to what extent that is a critical bottleneck for sustainable development;
- Comparing indicator-related performance across different units, such as how neighbouring communities or countries perform in relation to each other;
- Exploring relationships among elements, such as consumption, human wellbeing and ecosystem stress; human benefits and ecosystem stress from different economic sectors; and food sufficiency, income levels, income distribution, land degradation, agricultural productivity and food self-reliance.

Determining Improvement Potential

After initial analysis of performance patterns, focusing is required to determine which problem areas have the potential to be improved and which demand improvement most urgently, given the overall status of system wellbeing.

The analysis will undoubtedly reveal areas of system performance that are poor or bad. However, improvements cannot always be identified clearly nor may it be realistic to achieve them. For example, if 'armed conflict' is an element within the dimension of 'community' in an area but ensuring peace is not within the capacity of those involved in the assessment, this element might be treated as lying outside the scope for improvement within the context of their assessment.

Generally, some degree of improvement can be identified for the system indicators. The discussion then turns on two questions:

1. How much room for improvement exists and is needed?
2. Which elements require action most urgently?

These two questions are intertwined. The need for urgent action is partly determined by what is possible, and the degree of improvement is also influenced by the urgency for addressing underlying problems. Therefore, these questions will need to be answered iteratively. However, it is still a good idea to start by focusing on one question.

It is critical at this stage is to recognize that choosing indicator(s) to represent an element and discussing only the results from this aspect has its limitations. It inevitably involves a simplification of reality. Indicators summarize more complex cause-and-effect relationships. Tracking them can instigate a `wake-up call'. They point in the direction of problems. But they do not necessarily indicate the causes. Therefore, in discussing whether an indicator can be improved, it is essential to return to the wider problem and complexity of cause and effect.

Focusing too narrowly will often lead to an inadequate response. For example, an indicator that has a particularly poor score might be 'rates of alcoholism' as part of the element 'social cohesion.' Discussion of the extent to which it is possible to improve the rating will require considering a range of possible actions that deal with *prevention* of alcoholism as well as simply reduction. Other examples are the indicators: '% change in area of native forest' and 'fertiliser consumption (T/100 ha harvested area).' To assess whether the area of the native forests area can be increased or the amount of fertiliser decreased, a discussion on the range of causes of deforestation of native vegetation or on declining soil fertility is required.

Related to this is the question of information gaps. Sometimes an important element will have been left out of the analysis due to lack of reliable or adequate information (see Stage 6). A prioritizing of elements requires participants to go back to the structure of dimensions, elements and sub-elements, in order to identify where critical gaps may exist. These often constitute one action area, or require more research to fill the data gaps.

Proposing Policies and Actions

Once consensus exists on the elements that most urgently require action, a range of actions needs to be formulated: policy-related action and practical activities (see Box A55 or A56). Often, a problem needs to be tackled at different levels, so discussion will need to be wide-ranging. For example, over-fishing might require locally formulated and monitored sanctions to limit dynamite fishing, plus training at district level for patrol officers and national level legislation to prevent trawler action off the coast of small fishing villages.

A55. Policy-related Action Areas from Canada (Prescott-Allen, 1997)

In an assessment of the sustainability of the Canadian province of British Columbia, total ecosystem stress was differentiated according to source: food industry (agriculture, fishing, aquaculture, food manufacturing), timber industry (logging, wood and paper manufacturing), mineral industry (mining, quarrying, oil and gas extraction and processing, metal manufacturing), and the rest of society. The benefits produced by the industries could then be compared with the ecosystem stress they caused. This provided a benchmark against which to measure each industry's progress in increasing its contribution of GDP and jobs and reducing its overall stress on the ecosystem.

Gross Domestic Product (GDP) and employment (jobs) per unit of ecosystem stress (eco-stress): resource sectors in British Columbia, Canada

resource sector	Eco-stress	GDP CADm[7]	jobs 000[8]	CADm GDP / eco-stress	000 jobs / eco-stress
food	9	2000	54	222	6
timber	14	4987	106	384	8
mining	2	3396	38	1698	19

[7] millions of Canadian dollars
[8] thousands of jobs

Minerals mining in BC, according to this assessment, produced twice as many jobs and more GDP per unit of eco-stress than timber and three times as much as food industry work.
In proposing changes, participants will need to scrutinize existing polices and action areas to avoid duplication of effort. Where initiatives exist, objectives and targets can be reviewed against the light of system performance and performance criteria, and revised where necessary.

A56. Negotiating Action to Alleviate Water Scarcity in India (Development Alternatives/IUCN 1998)

After consensus was reached that water availability was the core problem facing the CNHalli taluk, discussion started on who was responsible for dealing with it. Suggested actions included planting trees, building check dams, making tanks, digging canals and de-silting tanks.

First responsibility was placed solely with the government. When the facilitating NGO asked if there was something that could be done locally, tremendous reluctance was shown. Even the idea of planting more trees was met with derision, since that would not resolve the immediate water shortage.

However, by a third meeting, people were already discussing and acknowledging that some farmers may be using too much precious ground water with flood irrigation. Some rich farmers already identified by the wellbeing assessment process, as having unfair access to water wanted to install more bore-wells. An option considered was to try to influence local banks to curtail loans to those who wasted water. Elements of equity thus emerged.

Explanations and demonstrations using government data showed that there was enough water for everybody, if it was equitably used and that the *gram panchayat* (village government) needed to explore options for better ground- and surface-water management. Further discussion ensued on the track record of governments to actually deliver on their promises and intentions, and whether there were any skills and experiences at hand that could attend to some identified actions. After three months of regular meetings, agreement was emerging that local actions could be taken alongside government interventions. These included: stopping flood irrigation, adopting water-saving irrigation devices and selling water, with a water tax going to the community.

The Pyramid of Action (a simple grouping of actions that can only be done by others, with outside help or by themselves) helped the *gram panchayats* and communities realize the limitations they place on themselves, and the need for attitudinal change that can lead to action and greater self-reliance. It helped reveal the unity that would be needed for joint action, and the complexity of environmental, social and political challenges where action was needed. The variety of elements that would need to be integrated towards a local sense of wellbeing suggested unforeseen demands on the local NGO, which had offered to act as a catalyst for change. This realization motivated a major exercise in institutional self-assessment.

Stage 7 may start with some simple initial categorization of action areas. However, it is likely to move quickly onto more detailed and contentious discussions. This stage may require considerable negotiation before agreement is reached. Different parties are likely to have ideas about the merits and pitfalls of different possible strategies. At this stage, it is clear that analysis needs to start linking into quite elaborate planning processes, which fall outside the scope of Wellbeing Assessment.

It is particularly important is that policies and action proposed are formulated by the relevant participants. Some proposals may fall within the sphere of power and control of participants. Asking villagers to propose new national legislation or international collaborative efforts may not be the most appropriate approach. Nor would it be effective to have district-level officials detail the micro-level changes that a community requires to improve its performance on, say, 'common property management',

Starting to Plan Priority Actions

Once priorities have been established, and policies and actions been identified the detailed task of planning priorities and actions can start. Those who are operating at the level at which the action is suggested to take place can accomplish this best. Many planning approaches exist that help to detail goals and activities, targets, timing and responsibilities. It is beyond the scope of this Resource Kit to discuss the existing literature on multi-stakeholder planning but some references are provided in 'Bibliography and Further Reading' (se B19).

Suffice it to say here that experience with Wellbeing Assessment has shown that action will start well before the last of the indices are aggregated and the last details of each action plan have been committed to paper. Depending on the commitment of stakeholders and how well they are informed about the assessment, few will delay action. The process is at least as valuable as the visual products. By participating in the assessment, stakeholders are motivated to act as soon as ideas start emerging.

Experience has demonstrated that all sorts of decisions and actions are produced by those involved in an assessment. These can include long-term institutional decisions, for example, on mission and goals. Short-term project decisions, such as strengthening activities in a particular location or starting research to improve knowledge of an element, are common.

Actions arise from decisions, and decisions are based on a combination of motivation (rooted in values, culture, knowledge, etc.) and of perception of the situation to be affected. Assessment influences both. The results of the assessment influence perceptions of reality (the system) through new information and fresh insights. The practice of assessment based upon questioning, hierarchical analysis, performance criteria and meaningful aggregation influences motivation through a challenging way of approaching decisions and action.

Coming Full Circle

Assessment is not a once-in-a-lifetime activity but part of a permanent cycle of action and reflection. Therefore, the decisions taken as a result of the wellbeing assessment, as well as those resulting from both organizational self-assessment and project self-assessment, will lead to actions that will influence the system, the organization and its activities, leading to a new situation that will require a new assessment. As decisions are made and actions taken, the assessment process continues to monitor progress and evaluate the results.

If self-assessment, as opposed to external assessment, in all its variants (system, organization, project) becomes ingrained in the culture of the organization or partnerships of organizations, as in IUCN, a shift in questioning can be expected from assessing the past to assessing the dynamic present. This shift would mean a move from "How well did we do?" to "How well are we doing?" and to other questions such as "Are the things we are doing working to change the system?", "Which actions are working best?", and so on.

In completing the assessment cycle – whether a two-year fully participatory process, or a much shorter assessment to provide information for another process – users should keep in mind two important points about Sustainability Assessments.

1. Sustainability Assessment cannot substitute or replace other methods. It is an input to other processes – planning, monitoring, evaluation, impact analysis, environmental education – but it cannot do away with the need for these process. Planning always requires good strategic planning tools and procedures, although a well-thought out assessment process can provide more complete information to help identify priorities. Similarly, monitoring systems can benefit from the inclusive nature of Sustainability Assessments. Evaluation and Impact analysis require good evaluation tools – an assessment can only provide the data for analysis, but the analysis tools themselves must come from somewhere else. The key point held in common by all of these processes is the need to use other tools, particularly those that allow users to explore cause and effect relationships, systemic properties, impacts and evaluation questions.

2. A Sustainability Assessment can only provide inputs to the needs identified at the start. In the very first stage, users are asked to explain why they are undertaking an assessment, in an attempt to make an informed decision about how the assessment results are to be used. Sustainability Assessments are of less value if they are not used to inform some other process. Awareness-raising amongst partners is always commendable, and the final assessment report will undoubtedly be of some interest. But ultimately, the results must be used to address some need.

At the end of an assessment cycle, it is worthwhile to consider undertaking an evaluation of the Sustainability Assessment. Evaluation questions can help to shape an understanding of the effectiveness, efficiency and reach of the assessment results, for example:

- Did the assessment process make the user more aware of environmental or human development elements than before?
- Did the assessment provide the information needed to make better strategic choices?
- Did the assessment framework help to develop a monitoring system?
- Did the assessment results provide information for a baseline, evaluation or impact study?
- Can the assessment results be used to educate others?

Implementing an Assessment

Due to the scale of the work in terms of spatial coverage, effort and resources required, most Wellbeing Assessments will involve one or more organizations that will form a planning and organizing group. This group will prepare a proposal for the assessment, obtain the funds, identify and recruit participants in the assessment, establish a steering committee, and set up a team to do the technical work of the assessment.

The cost of the assessment depends on its scope, the nature and capacity of the existing information and assessment system, whether people with the necessary skills and experience are available locally, and local costs. The first assessment is likely to cost more than subsequent assessments. A network of participants needs to be formed. Capacity building and training will be needed. Monitoring, statistical and mapping systems may have to be established or upgraded. Crucial information gaps will require filling. These costs are once only, although capacity building may be ongoing as staff change and new participants come on board.

A good proposal will include goals, purposes, objectives, outputs and activities (see Section 16 of Part B). Essential activities that the assessment project will need to do to achieve its goal are listed here and described briefly below:

- Identifying and recruiting participants
- Establishing a steering committee
- Forming a technical support team
- Organizing the assessment stages (see Section 14 of Part B)
- Communicating the assessment process and results
- Building capacities and constituencies
- Following up and applying the assessment.

More guidance on these tasks and processes topic is offered in Sections 14 through 16 of Part B.