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Social and Environmental Sustainability of Agriculture and Rural Development Investments: A Monitoring and Evaluation Toolkit

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Acronyms

ADB	Asian Development Bank
ADF	African Development Fund
ARD	Agriculture and Rural Development (World Bank)
BAT	Best Available Techniques
BOD	biochemical oxygen demand
BP	Bank Procedure (World Bank)
CAFTA	Central American Free Trade Agreement
CAS	country assistance strategy (World Bank)
CBO	community-based organization
CDE	Centre for Development and Environment
CIAT	International Center for Tropical Agriculture
COD	chemical oxygen demand
CONAFOR	National Forestry Commission
DLS	Department of Livestock Services
EA	environmental assessment
EIA	environmental impact assessment
EMP	environmental management plan
EMS	environmental management system
EU	European Union
FGD	focus group discussion
GEF	Global Environment Facility
GHG	greenhouse gas
GIS	geographic information system
GP	Good Practices (World Bank)
GSP	geographic positioning system
GTZ	Deutsche Gesellschaft f¸r Technische Zusammenarbeit
ha	hectare(s)
HACCP	Hazard Analysis and Critical Control Points
HCG	Helsinki Consulting Group Ltd
HH	household
IDS	Institute for Development Studies
IFFN	International Forest Fire News
ILU	Indigenous Land Units
IMF	International Monetary Fund
IPM	integrated pest management
IPP	Indigenous Peoples' Plan

IRENA	Indicator Reporting on the Integration of Environmental Concerns into Agriculture Policy
IUCN	International Union for Conservation of Nature and Natural Resources (since 1990, The World Conservation Union)
JSDF	Japan Social Development Fund
KAP	knowledge, attitudes, and practices analysis
LADEP	Limpopo Agricultural Development Programme (South Africa)
LDP	Livestock Development Programme (Kenya)
LIF	Local Initiatives Fund
LIRA	livestock industry-related associations
M&E	monitoring and evaluation
MCA	Multicriteria Analysis
MIS	Management Information System
MSC	Most Significant Change Evaluation
N.d.	no date
NDF	Norwegian Development Fund
NEAP	National Environmental Action Plan
NFFP	Namibia-Finland Forestry Programme
NGO	nongovernmental organization
O&M	operations and maintenance
ODI	Overseas Development Institute (UK)
OECD	Organisation for Economic Co-operation and Development
OHS	occupational health and safety
OP	Operational Policy (World Bank)
PAD	Project Appraisal Document (World Bank)
PDO	Project Development Objective
PEF	Programa EstratÈgico Forestal (Strategic Forestry Program)
PFS	Participatory Forest Survey
PIU	Project Implementation Unit
PM&E	participatory monitoring and evaluation
PMT	project management team
PRA	Participatory Rural Appraisal
PRM	Pastoral Risk Management
PSIA	Poverty and Social Impact Analysis
QFRMP	Qinghai Forestry Resources Management Project
RAPID	Research and Policy in Development
REAP	Regional Environmental Action Plan
RP	Resettlement Plan
SD	sustainable development
SDI	Sustainable Development Indicator
SEA	Strategic Environmental Assessment
SEBS	Socioeconomic Baseline Studies

SFMP	Sustainable Forest Management Project
SIA	Social Impact Assessment
SLP	Sustainable Livelihoods Programme
SOE	state-owned enterprise
SPS	sanitary and phytosanitary standards
sq km	square kilometer
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TOR	terms of reference
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WB	World Bank
WBG	World Bank Group
WDI	World Development Indicators

Organization of the Toolkit

The purpose of this toolkit is to provide practical guidance in the monitoring and evaluation (M&E) of the environmental and social sustainability of Agricultural and Rural Development (ARD) programs and projects. The primary audience is agriculture and rural project managers, specifically field personnel, communities, client governments, other stakeholders, and World Bank Task Teams.

Chapter 2 sets out the conceptual framework by examining the sectoral context of environmental and social sustainability and the resulting implications for project preparation, appraisal and implementation. Figure 2.1 in section 2.3 illustrates the possible entry points in the project cycle for mainstreaming environmental and social sustainability concerns, advocating that such concerns be considered as recurrent significant themes throughout the project cycle. Compliance with the World Bank's environmental and social safeguard policies is an important first step in this direction. A program or project that has been designed to achieve positive environmental and social outcomes or to contribute to higher level environmental and social goals improves the chances of overall program/project outcomes being sustained over the long term.

Chapter 3 takes a closer look at the Bank's M&E requirements based on the results-based framework, which place greater importance on tracking results, compared to monitoring implementation under the logical framework system. Potential issues in this respect were flagged, particularly the possibility of omitting relevant environmental and social outcomes and impacts in developing the results framework. Section 3.1 lays out practical guidelines for mainstreaming environmental and social sustainability into program/project M&E. The use of participatory M&E is strongly promoted as this approach has proven quite effective because it engenders ownership by project stakeholders while enhancing the quality of project outcomes. Participatory M&E will be particularly useful as countries set up their own safeguards systems for ensuring environmental and social sustainability of investment and development priorities. This toolkit can provide valuable practical guidance for the ARD sector in coordinating participatory M&E.

Chapter 4 introduces appendix 1, which contains 11 matrices of sample indicators, organized by ARD subsector, of potential environmental and social changes that may be observed at outcome and impact levels as a result of a program/project's being implemented. The sample indicators aim primarily to raise awareness and guide the identification of appropriate indicators of environmental and social sustainability of a program or project. They are not to be taken as blueprints. The indicators may be used in specific combinations or adapted to suit the particular project context to help assess the quality of

project outcomes on various social groups or regions/areas of concern. Clearly, local conditions and the specifics of the project context must be the basis for further indicator development.

Finally, chapter 5 introduces appendix 2, which contains 22 individual fact sheets on the recommended tools and methods that are deemed practical for fieldwork. Each fact sheet provides key information about a specific tool or method. The fact sheet includes a case study of an actual application of the tool or method on a completed or ongoing project to demonstrate current practice and experience with the tool/method.

Principles of Integrating Sustainability in Monitoring and Evaluation in Agriculture

1. Background and Rationale

The objective of the toolkit is to develop a set of practical tools and indicator examples for tracking and assessing ***environmental*** and ***social sustainability*** of Agricultural and Rural Development (ARD) programs and projects. The M&E process is an integral part of development cooperation at the policy, program/sectoral, and project/field work levels. In this toolkit, M&E methods are described on the program/project level. The primary audience is agriculture and rural project managers, specifically field personnel; communities; client governments; other stakeholders; and World Bank Task Teams. The overall purpose of the work is to create awareness of quality project design and monitoring and ensure that the cross-cutting issues—the environmental and social aspects—can be effectively integrated into project cycle management.

2. Conceptual Framework

Programs and projects in the agriculture/rural sector often are underpinned by a diverse set of goals and objectives, including poverty reduction, natural resource management, local economic development, social and gender equity, and good governance. When combined, some of these goals and objectives can lead to trade-offs in which environmental values and particular groups of people or places are disadvantaged as a result of planned interventions. The WB's strategy for rural development, *Reaching the Rural Poor* thus calls for addressing rural areas in their entirety, that is, all of rural society and all economic, social, and environmental aspects of rural development. Furthermore, the WB's common policy for all projects is that environmental effects should be identified and negative effects minimized or mitigated. Projects should support sustainable social and environmental development.

2.1. Environmental Sustainability

The basis for environmental sustainability in World Bank projects is established during the project preparation through/and in the special assessments (for example, EA, EIA, SEA, EMP). Their purpose is to guarantee that the aim, implementation methods, side effects, and the final outcomes of a project will meet acceptable environmental standards. Such documents also will set allowable emission limits and restrictions for environmental degradation and define necessary measures to protect the environment. They also may provide technical information for environmental management and monitoring. In ideal cases, proper application of these tools will ensure due environmental consideration. In practice, however, it is necessary to increase the level of environmental awareness and necessary response among all the stakeholders, for example, in regard to M&E activities. From an environmental standpoint, the critical rural sustainability issues would encompass those shown in box 2.1.

The assessment of a project's environmental sustainability should start with the consideration of documentation prepared during the project planning and appraisal stages (EA, EIA, SEA, EMP). The question is whether these tools and the conditions have been properly adopted, followed, and monitored. In general, M&E of environmental sustainability issues in ARD implies the following points of inquiry:

1. Analyzing whether the economic activity to be developed in a project within the ARD component, in general and in its details, *harmonizes with the national policy of sustainable development.* Such policies may have been described in documents such as the Country Environmental Analysis, National Environmental Action Plan (NEAP), Strategic and Sectoral EIA, international conventions, and special policy papers on sustainable

Box 2.1 Main Environmental Concerns

Agriculture and rural development activities can have both positive and negative effects. Appropriate management and practices can prevent or mitigate the potential negative effects mentioned below.

Resource degradation. Land degradation from overgrazing, intensive cultivation, fires, and improper water and waste management may irreversibly reduce the productivity of land, and in arid areas lead to desertification. Improper irrigation causing salinization, and water logging may decrease land productivity. Poor forest and rangeland management may reduce the productivity of vegetation and may result in soil erosion and desertification. Over-exploitation of any natural resource (for example, fish, game, herbs) may damage stocks, whose recovery may be lengthy. Proper planning and management of resources use is necessary to make sure that the *use* is based on sustainability principles.

Pollution. In areas of intensive cultivation, the main concern is pollution dispersed from agricultural lands, which causes eutrophication and damages watercourses and their bioresources.* Agrochemicals such as fertilizers, herbicides, and pesticides may pollute soil and water and unintentionally damage the natural environment. Poor waste management from livestock production including from improper manure handling, slaughter houses, and food processing plants can be the main point-source polluters. Improper use of machinery may pollute air and discharge oil pollution. There are a number of modern pollution control techniques and technologies that may protect the environment.

Loss of habitats and biodiversity. Vast natural areas populated and cleared for agriculture and monocultures may degrade valuable landscapes, habitats, and biodiversity. Natural water resources taken for irrigation may destroy water habitats and, for example, fish stocks. Drainage of lands may have negative impacts on water quality and hydrology of watercourses and destroy wetland habitats. Logging and selective tree cutting may change forest habitats (for example, fragmentation), endanger species of fauna and flora, and reduce the productivity of forest. Fencing, competition with livestock, habitat degradation, disturbances, poaching, and hunting may deplete wildlife. Nature conservation areas should be defined with regard to developing resources use. Restoration of habitats may be needed to reduce past environmental degradation.

Increase in natural risks. Emissions into the air cause the "greenhouse effect," which is known to cause and exacerbate climate change. Global warming then increases floods, hurricanes, droughts, desertification, and melting of glaciers and permafrost. Deforestation and over-grazing increase flood risks, land degradation, landslides, and mudflows. Improper use of fire in agriculture may increase risks for bush and forest fires.

Impact on food quality and consumer health. Use of dirty irrigation water, inappropriate agrochemicals, and unhygienic treatment and storage may spoil agricultural products. Some animal diseases (zoonoses) can be transmitted to humans. Poor management of veterinary chemicals, such as antibiotics, can develop antibiotic resistance in bacteria, with detrimental effects on humans and animals.

Note: *Eutrophication is the process by which water bodies receive excess nutrient run-offs that stimulate excessive plant growth (algae, nuisance plants, weeds), which deoxygenates the water, killing beneficial organisms.

development. The development supported by a project may lead directly to an unsustainable situation, accentuate negative trends in the state of the environment, or result in indirect unwanted side effects or cumulative impacts. For example, in the Amazon, one of the key environmental goals is to stop deforestation. Therefore, any ARD project supporting clearing of intact forest for farming purposes, directly or through agricultural land extension, should be seen to contradict the common national goal and should be abandoned. In the Aral Sea basin, the national strategy documents define a need for more economic use of water resources to sustain the availability of water downstream and in the Aral Sea. Therefore, the ARD projects in the basin should promote cost-effective water-saving irrigation technologies instead of merely extending irrigated lands.

2. Analyzing which activities directly or indirectly supported by a project may have *environmental effects*—positive or negative—and which habitats, ecosystems, landscapes, species of fauna and flora, and groups of people are affected. Special emphasis should be paid to valuable or endangered elements, and processes of nature and protection of such targets should be ensured. The analysis should be based on scientific research on the elements and processes of nature in the project area or at least in similar natural environments. For example, a project may increase cropping in marginal areas, firewood cutting, and overgrazing, all of which are significant causes of biodiversity losses and land degradation. Most irreversible land degradation occurs around settlement areas and water points and along livestock trek routes. Again, pasture rotation and consideration of carrying capacity of pastures vs. livestock units may have positive effects on the environment. The project activities and all consequent activities supported should be assessed by considering their immediate and accumulative environmental effects.
3. Assessing the *techniques, materials, and resources* used in the project considering the minimization of negative environmental effects of the project and maximization of the beneficial ones. The use of Best Available Techniques (BATs) and Appropriate Technology should be analyzed, and alternative solutions for environmental protection supported. The BATs include any common technologies and techniques that provide the best environmental performance considering also local capabilities and resources. Appropriate technologies are those suitable for local conditions, not necessarily those used in high-technology countries. For example, the use of pesticides and herbicides also may have unwanted negative effects on the natural ecosystems outside of the cultivated lands. In contrast, using integrated pest management (IPM) may give acceptable results with minimal or no chemical use. In addition, the reasons for replacing bulls with tractors should be carefully assessed—technological recommendations must be consistent with the local socioeconomic conditions. The most appropriate and economic source of energy in technologies also needs special attention.
4. Analyzing the *likelihood and severity of risks* that may lead to sudden or gradual environmental degradation due to accidents, fire, natural hazards, and unexpected or cumulative impacts of the project. Especially critical are

projects that deal with significant amounts of chemicals (agrochemicals, oil products, heavy metals) or dangerous or hazardous wastes (unused pesticides, lubricants), involve major construction and transportation, or radically change the natural environment (reservoirs, irrigation schemes, plantations, forest clearing). Exploitation of land resources also may trigger accidents and natural hazards. For example, over-grazing and deforestation may result in landslides and floods, and slash-and-burn farming may result in extensive forest fires.

5. Assessing the quality and quantity of *mitigation measures* planned or applied in the project to minimize or reverse environmental degradation. In some cases, it is possible to reduce the damage to the environment by applying environmental technologies or other protective investments. For example, to mitigate pollution from cattle houses, storage of manure should take place in a designated building having a roof and impermeable floor. Another mitigation measure could be that, after manure is spread, the field is ploughed to minimize run-off of nutrients to watercourses. The protective measures used should balance the costs of the project and the magnitude of potential environmental damage. Thus, mitigation measures in agro-industrial plants may be costly investments.
6. Assessing the efficiency of environmental *control and monitoring methods* used to ensure that the impacts of the project remain at acceptable levels and that the response to any breach of agreed or allowed levels is effective. Monitoring also may reveal any positive environmental effects as a result of the mitigation measures adopted in the project.
7. Analyzing and strengthening the *management capacity* of relevant authorities, project personnel, and other key stakeholders in their work to identify, understand, present, mitigate, and monitor any emerging problem potentially causing environmental degradation. An integral part of such capacity is the availability and efficiency of the administrative tools of environmental management (legislation, regulations, permissions, sanctions). In the M&E of a project, special training and capacity building can be proposed whenever environmental consideration is inadequate.

2.2. Social Sustainability

The WB rural development strategy identifies the primary target group of ARD programs/projects as the "rural poor"—a collective term for landless farmers, individuals and households with few assets, smallholders, pastoralists, rural women (especially women-headed households), ethnic minorities, and indigenous populations. The "rural poor" are not homogeneous. They comprise groups of people who represent a wide range of cultures and social classes, with their own unique worldviews and indigenous or local knowledge and practices that must be recognized and taken into account in any effort to improve their conditions. They live and work within their own unique networks of social relationships embodied in institutions (both formal and informal), regulated by norms, standards, and rules. The rural poor also are the most vulnerable during conflict and post-conflict and natural disasters. Box 2.2 describes the general circumstances of these groups and why they are considered to be poor.

Box 2.2 Who are the "Rural Poor"?

Farming households without land or with few assets—typically engaged in smallholder agriculture, mainly for subsistence with limited capacity to produce marketable surpluses or expand their production base. The nonexistent or limited assets of these farming households often force them toward an unhealthy dependence on their landlords, unscrupulous creditors, and middlemen for their production, and in times of serious crop failures or calamities, even consumption requirements. These rural poor may need to rent out their labor to other farmers, leaving themselves little time at key moments such as planting or harvest. These households may be deeply in debt; the men, women, and children poorly nourished; and the children (particularly girls) out of school. They also are more likely to be driven to exploit the natural resources within their reach for survival. This depressing scenario may be tempered slightly by the social supports of religion or cultural behaviors (particularly the group ethos of some ethnic minorities) and by economic support from community or individual benefactors, government programs, or donor assistance.

Women, especially female-headed households. Women carry out the majority of the work in rural households (particularly in Africa)—rearing children, looking after elderly members, fetching water for drinking and domestic uses, tending the animals and backyard garden, and helping with the planting and harvesting. Women's workload increases significantly when the men leave the village to seek wage employment, or in female-headed households, as the women also assume responsibility for the labor-intensive work on farms.

The impact of HIV/AIDS has been particularly felt by women, as they need to nurse sick relatives, often while sick themselves, as well as take responsibility for all agricultural tasks or income generation if their partner has died. In many societies in developing countries, the inferior legal and cultural stature of women prevents them from owning land or other assets, partaking of opportunities for education or personal advancement, or sharing in the earnings from farming. In some societies, women also suffer mental or physical abuse from their husbands and relatives. In some cultures, after the death of the husband, the assets of the woman, such as land, pass to the ownership of his family. Sometimes even the woman herself is passed to a male relative. Women's full potential as human beings remains untapped, and their leadership qualities, shaped from years of managing the household, remain underutilized. On the positive side, in many societies, women have earned the reputation of being capable managers from having primary responsibility for household budgeting and spending, and also are considered reliable members of savings and credit schemes or loans.

Children and the elderly. In addition to female-headed households, the children and the elderly often are the most vulnerable members of rural households in times of severe stresses brought about by conflict and post-conflict, and natural disasters or calamities. As a result of HIV/AIDS, many families have lost adult wage-earners, and children or the elderly are left to care for themselves. In very poor rural communities, young children are being forced to work in wage employment, exposing them to occupational safety and health risks and curtailing their future human capital potential as a result of having to leave school. The elderly, who are more prone to illness because of advancing age, also are forced to lead unproductive, marginalized lives in many developing societies.

Indigenous peoples. These groups are characterized by their unique and distinct cultural identities and traditional ways of life. Their existence is defined by their close, intricate relationship with their natural and physical environment (for example, pastoralists,

Box 2.2 (*continued*)

hunter-gatherers). Their very existence is continuously under threat from forest development activities, expanding agricultural settlements, mining concessions, tourism, and bioprospecting. They also are subjected to social discrimination owing to their unique physical features, and their physical isolation means that they are rarely represented in local political processes. In the recent past, the traditional knowledge and practices of indigenous peoples have begun to be valued for their high potential for sustainability, for example, the communal nature by which they use and manage natural resources; and plant species known to indigenous communities that have medicinal applications, which are valued by pharmaceutical companies.

Ethnic minorities—groups identified by caste, race, religion, and/or language. Traditions or customary practices, cultural constraints, and legal or institutional barriers in developing societies have prevented them from enjoying the socioeconomic privileges and benefits easily accessible to the majority of, or dominant groups in, the population. Ethnic minorities are likely to be in poor health, have low educational attainment, and limited skills. They often are physically and socially isolated and, in most cases, asset-poor, with limited physical and financial capital of their own, which limits their livelihood options.

Source: Authors.

The social sustainability of a program/project implies two serious and opposite outcomes:

1. Generating long-term, positive outcomes for as many segments of the population as possible given available resources
2. Recognizing that some groups may be disadvantaged or made worse off by planned interventions, and taking responsibility for reducing or mitigating social risks.

The most recent Social Development Strategy (WB 2005a) identifies the three operational principles guiding its approach to social development as:

1. *Inclusive institutions* promote equal access to opportunities, enabling everyone to contribute to social and economic progress and share in its rewards.
2. *Cohesive societies* enable women and men to work together to address common needs, overcome constraints, and consider diverse interests. They resolve differences in a civil, nonconfrontational way, promoting peace and security.
3. *Accountable institutions* are transparent and respond to the public interest in an effective, efficient, and fair way.

Another useful resource, the WB "Social Analysis Sourcebook" (2003) refers to the social dimension of sustainable development as "equitable economic opportunity and widely shared benefits," which may be achieved through the following strategic outcomes of social development components of any program/project:

- *Social inclusion*. Removing institutional barriers and enhancing incentives to increase the access of diverse individuals and groups to development opportunities.

- *Empowerment*. Enhancing the assets and capabilities of diverse individuals and groups to function, and engaging, influencing, and/or holding accountable the institutions that affect them.
- *Security*. Improving the management of the social risks arising out of development interventions.

In practical terms, ensuring that a program/project is socially sustainable involves deliberate processes during project preparation and in subsequent implementation for "inclusion" of all, regardless of gender and ethnicity, who may have a stake or interest in, or who can influence the resolution of, a development problem or issue. It may not be possible to satisfy the desires of everyone, but at least all possible stakeholders should be recognized and their viewpoints acknowledged. It also means respecting and acknowledging the diverse cultures, local knowledge, and practices of various social groups; and harnessing the diversity and indigenous knowledge to design socially appropriate and relevant interventions. Monitoring project outcomes is necessary to ensure that they are on track to achieve the overall objectives, and if not, to modify the activities accordingly. Most of the "rural poor" are believed to be living in or on the margins of resource-poor lands. Thus, in the face of mounting resource depletion and environmental degradation, it also is imperative to protect or diversify their livelihood bases.

Hence, social sustainability of a program/project is enhanced by thoughtful consideration of the following concerns during project preparation, appraisal, and implementation:

1. ***Understanding how various social groups will be affected by the project***. The project preparation stage should at best anticipate how planned interventions will affect, or will be affected by, various groups of people. A project will either benefit or disadvantage social groups in different ways and at different times. Some groups, such as women (especially women-headed households), children, the elderly, indigenous peoples, and ethnic minorities are particularly vulnerable to introduced changes in their physical environment or socioeconomic base. They stand to lose if their special circumstances are not thoughtfully taken into account.
2. ***Giving special attention to social groups or places that are adversely affected***. The project may produce outcomes that have long-term implications on social development, and these social impacts will manifest themselves over space and time—that is, during project implementation (for example, from infrastructure development), operations (inputs and services from the project), and at full development. In the same manner that the project preparation stage looks closely at potential effects on various social groups, the M&E approach and practice should accord special attention to any groups who may be disadvantaged by project activities and subsequent operations. At best, "all projects must aim to achieve the social development outcomes (whether inclusion, participation, and/or social risk management) promised in their design" (WB "Social Analysis Sourcebook" 2003). Achieving these social outcomes means, at the very least, monitoring the progress of implementation as well as the results of mandatory

Resettlement Plans, Indigenous Peoples' Plans, and other relevant mitigation plans.

3. ***Emphasizing participation***. The local, place-based nature of sustainability issues implies that the active involvement and contribution of local communities is a crucial element of efforts to resolve or address such issues. A well-structured and widely consulted participation plan provides opportunities for affected stakeholders to participate actively and meaningfully not only during project preparation but, more importantly, also during its subsequent implementation, monitoring, and evaluation. Active and sustained participation improves the quality of project outcomes. However, in the long run, it also empowers local communities by promoting self-expression and confidence, and harnessing the potential for social relationships to lead to individual and collective initiatives to improve their current situations.

   One additional step is to promote social accountability for project outcomes through consistent, structured engagement of project participants from the early planning stages of project activities through their implementation and subsequent operation. In this context, participation also encompasses access to project-created opportunities for socioeconomic improvement of all interested stakeholders, regardless of gender or ethnicity. The program/project may need to develop stakeholders' capacities to participate effectively and to accommodate the inputs and contributions from such participatory implementation processes in project decision-making.

Sample indicators of social and environmental outputs, outcomes, and impacts of various subsectors of agriculture and rural development are presented in appendix 1. The purpose of the subsector matrices is to create awareness of the most important social and environmental issues; and rather than be a blueprint, to provide examples of potential indicators and a comprehensive list of all potential indicators. It also is important to note that the sample indicators deal with only social and environmental sustainability. It is not in the scope of this publication to cover all possible areas for monitoring. For example, institutional and economic sustainability are not covered.

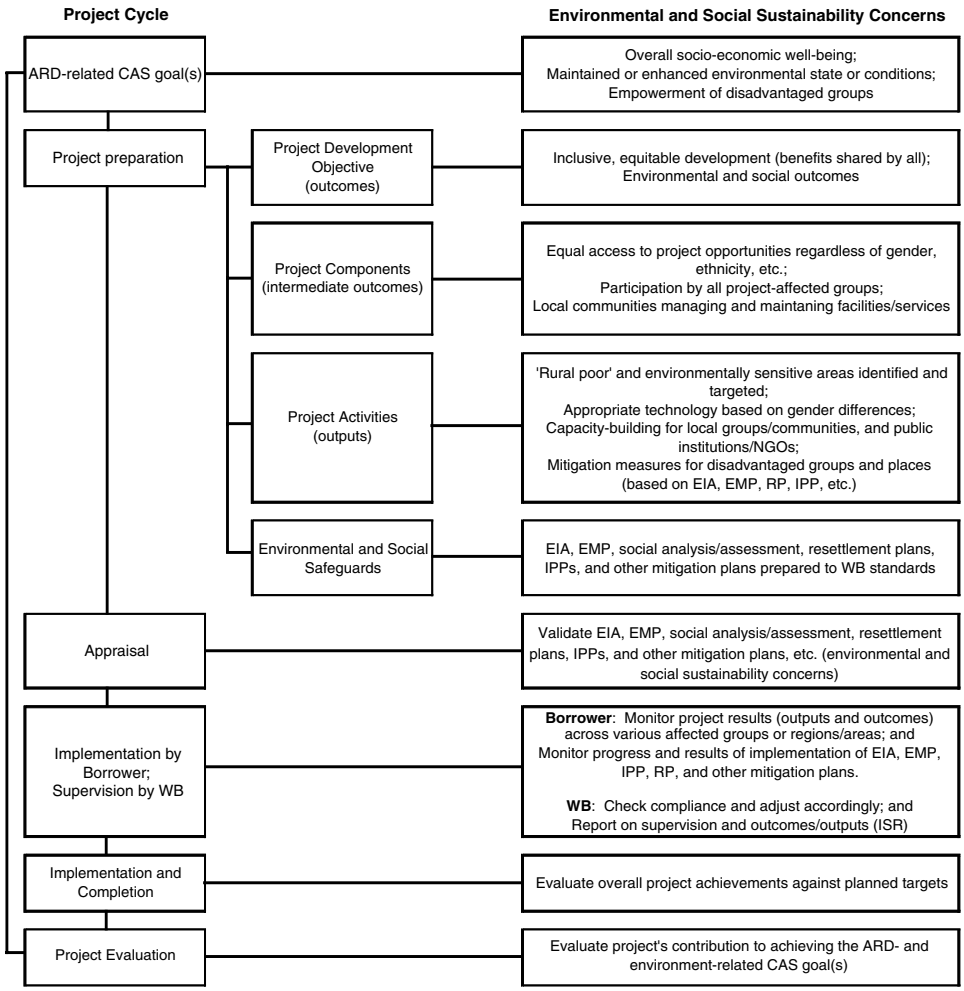
2.3. Entry Points in Project Cycle

Figure 2.1 depicts the various possible entry points for the consideration of environmental and social sustainability concerns in a typical project cycle.

Figure 2.1 conveys the key message that environmental and social sustainability concerns should be viewed as recurrent significant themes throughout the project cycle from project preparation through implementation and completion. If a program or project is designed to achieve positive environmental or social outcomes or contribute to higher level environmental and social objectives, the chances of overall program/project outcomes being sustained over the long term are vastly improved.

The WB's environmental and social safeguard policies (box 2.3) are the vanguard of the Bank's efforts to ensure the social and environmental

Figure 2.1 Entry Points for Environmental and Social Sustain Ability Concerns in the Project Cycle



Source: Authors.

soundness and sustainability of any investment project. The Bank requires a number of mandatory assessments (box 5.1) to meet these safeguard policies. The assessments help ensure that the environmental and social implications of any potential investment or technical cooperation project are identified and assessed early in the Bank's project planning and approval process, and that environmental and social considerations are incorporated in the preparation, appraisal, and implementation of projects at an appropriate level.

The assessments also identify ways in which a potential project can be enhanced by incorporating measures to achieve environmental and social benefits or improvements. The main focus is how the project can mitigate predicted adverse consequences of planned interventions on groups of people, especially on already vulnerable groups such as women and children, indigenous peoples, ethnic minorities, and landless or resource-poor farmers;

Box 2.3 World Bank Environmental and Social Safeguard Policies

1. Environmental Assessment (OP/BP 4.01)
2. Natural Habitats (OP/BP 4.04)
3. Pest Management (OP 4.09)
4. Physical Cultural Resources (OP/BP 4.11)
5. Involuntary Resettlement (OP/BP 4.12)
6. Indigenous Peoples (OP/BP 4.10)
7. Forests (OP/BP 4.36)
8. Safety of Dams (OP/BP 4.37)
9. Projects on International Waterways (OP/BP 7.50)
10. Projects in Disputed Areas (OP/BP 7.60).

Source: www.worldbank.org/safeguards.

and on regions or areas of special environmental concern. If a project's environmental and social intentions are well thought out at the project design stage and duly articulated in the project design framework, environmental and social aspects, including M&E, become integral considerations of project implementation arrangements.

The other entry points illustrated in figure 2.1, such as implementation and evaluation, require a more independent selection of tools at the discretion of the project/program designers and managers. This guideline aims to assist them in this process.

3. M&E in the World Bank

As M&E of environmental and social sustainability is the subject of this toolkit, the implications on the WB's M&E requirements are examined here in greater detail.

3.1. WB M&E requirements

The WB Operational Manual defines ***monitoring*** as "the continuous assessment of project implementation in relation to agreed schedules and use of inputs, infrastructure, and services by project beneficiaries," and ***evaluation*** as the "periodic assessment of the relevance, performance, efficiency, and impact (expected and unexpected) of the project in relation to stated objectives." M&E broadly viewed is a function of project management useful for validating ex-ante analysis and for influencing adjustments to project implementation or course correction if deemed necessary.

In 2003 the WB adopted a *results-based M&E framework*. This action involved a shift from monitoring implementation (logical framework) to tracking results (results framework), and placing greater emphasis on monitoring project outcomes rather than project inputs and outputs. A results-based M&E framework requires a definition of outcomes and outcome indicators at two levels: the Project Development Objective (PDO) level and the component level (intermediate outcomes).

As mentioned, a key feature of a results-based M&E framework is the emphasis on project outcomes. Outcomes are the intermediate effects of outputs on the target group, thereby addressing the issue of coverage and adoption of the project outputs. Indicators of project impacts (that is, the higher level sector development goals to which the project is expected to contribute) are no longer required by the results-based M&E framework. This change limits incorporating environmental and social sustainability issues into project M&E for two reasons:

- Environmental and social sustainability typically are characterized by changes or trends taking place over the long term and thus are best captured by impact indicators. However, using impact indicators should not preclude specifying outcome indicators that capture immediate changes in the relevant environmental and social variables.
- The application of a results-based framework may unduly emphasize quantitative indicators for project outcomes and outputs, thus limiting the representation of sustainability concerns in the project M&E framework. This limited representation argues for the parallel use of the logical framework in project design to complement the results-based framework, so that the intended links between project outputs and outcomes (PDO) to project impacts (development goal) can be well articulated.

In practice, the M&E process during the implementation of a project also still needs output indicators that reflect the efficiency of the use of project resources (inputs).

3.2. Guidelines to Mainstream Environmental and Social Sustainability in M&E

Some guidelines for mainstreaming environmental and social sustainability concerns are recommended as follows:

1. ***Outcome and output statements***. The project outcomes (PDO and component levels) and outputs (activity level) should clearly articulate the environmental and social preconditions for project success (figure 2.1). Articulation implies being clear as to who are target groups ("rural poor" and which segments) or acknowledging that there may be adverse impacts on certain groups or people or regions/areas. The involvement of environmental and social assessment teams as early as the project identification and preparation stage will help ensure full understanding of relevant sustainability issues and practical and feasible treatment in the project design.
2. ***Quantitative and qualitative indicators***. "What gets measured gets managed," as the common adage goes, may have guided the choice of indicators toward the quantitative type. However, while a challenging task for project planners, describing the "quality" of project outputs and outcomes alongside "quantity" of project achievements provides a fuller description. Some social development outcomes lend themselves easily to quantitative assessment. However, other aspects of social change processes and impacts—perceptions of change, strengthened community structures, social cohesion, retained cultural identities—are best captured only by qualitative indicators. To a certain extent, the same applies to nature protection (biodiversity, reserves, landscape), whereas many other environmental values (pollution, land degradation, stock depletion) can be measured in quantitative and economic terms. For example, poverty incidence may be expressed in quantitative indicators; however, monitoring poverty incidence requires robust statistical data typically generated by longitudinal surveys. Most programs/projects may not have the level of resources nor the capacity to undertake the latter.
3. ***Progress and outcomes of environmental and social safeguard plans.*** A practical starting point for M&E of sustainability concerns are the key assessments required to meet the environmental and social safeguards that the WB requires for program/project approval. These safeguards usually produce specific plans such as the EIA, EMP, Resettlement Plans, and Indigenous Peoples' Plans. To assess a particular project for coverage of social and environmental sustainability issues, an entry point would look at how the project M&E system tracks the progress and outcomes of these specific plans and whether project decision-making takes into account the monitoring results.
4. ***Positive environmental and social outcomes***. The plans prepared to meet the safeguard policies of the WB give an assurance that whatever "harm" is

generated by a project will be avoided if possible, or if not, will be minimized or remediated. However, positive environmental and social outcomes also may arise as a result of project interventions, whether previously predicted or not, and they deserve to be recognized as part of project achievements. Unintended outcomes also may be positive, for example, the demonstrated uses/values of traditional knowledge and practices.

5. ***Environmental indicators***. On the environmental side, the entry point could be the EA/EIA or EMP, which in principle should incorporate sustainability aspects and monitoring arrangements or a project-specific outline of environmental indicators prepared in conjunction with the project design. In many cases, such a monitoring procedure is rather technical and is restricted to the major physical interventions of a project, such as construction). Therefore, it is necessary to develop environmental indicators that will reflect environmental performance and sustainability in a broader sense, and in practical terms for the project M&E process.
6. ***Social indicators***. Country-level social assessments, such as the Country Social Analysis (CSA) and Country Gender Assessments, are an important reference for developing relevant indicators of social sustainability for a program or project. Where available, these documents provide useful background context on broad social and political issues in a particular country. Likewise, the social analysis and assessments carried out during project preparation are practical starting points for building relevant social indicators specific to the program or project.
7. ***Participatory M&E***. The WB also places significant emphasis on participatory M&E, which is an important factor in promoting social sustainability. The WB "Social Analysis Sourcebook" (2003) cites participatory M&E as a

   > *"means to systematically evaluate progress and impact early in the project cycle by bringing the perspectives and insights of all stakeholders, beneficiaries as well as project implementers. All stakeholders identify issues, conduct research, analyze findings, make recommendations and take responsibility for necessary action."*

   The participatory aspect of the process is particularly effective because stakeholders involved in identifying problems and solutions develop ownership of the project and tend to be amenable if corrective actions later prove necessary. When living with the results of the project, they also have more incentive to make changes in activities and feed lessons learned into future interventions. Participatory M&E also may highlight unexpected or unplanned changes, which may not be noticed with traditional indicators and M&E systems. However, an important starting point is to ensure that the stakeholders understand the benefits of their participation. Too often, projects have treated beneficiaries as passive recipients of aid, and a conceptual change is required for both community members and governments to see the value in active participation of the target groups. The EIA processes that are mandatory for major projects in most countries include several stages for public participation.

Participation can be both an end and a means. However, a decision must be taken as to how much participation is feasible in terms of time or money. Neither the project beneficiaries nor the managers can afford to waste their time. It also is vitally important to show tangible results within a reasonable amount of time in terms of project achievements to avoid the situation in which stakeholders become bogged down in the process and lose interest in the project.

In environmental management, many countries have ratified the "Aarhus Convention," which ensures for anyone (1) access to information, (2) participation in decision-making, and (3) the right to environmental justice. Participatory M&E also will be particularly useful as countries set up their own safeguards systems for ensuring environmental and social sustainability of investment and development priorities. Although focused only on the ARD sector, this toolkit will be useful in this regard.

8. ***Practical M&E arrangements***. In organizing the M&E function, the environmental and social aspects may comprise separate components or units of the M&E system. Environmental and social phenomena are captured using entirely different data collection/processing systems. Nonetheless, it should be made clear how information on outcomes and impacts from these two components converge or relate to each other.

   Mainstreaming environmental and social sustainability in existing M&E procedures also is possible. For example, if a project is already using socioeconomic surveys, the entry point could be incorporating in the survey methodology relevant queries on gender relations or other relevant social processes. At the very minimum, the project's Management Information System (MIS), which compiles project "statistics" based on quantitative indicators of outputs and intermediate outcomes, could incorporate disaggregated data of relevance to social sustainability concerns such as gender or ethnicity (and other demographic) characteristics of social groups or census of resettled households.

   Of course, only recording the data is not sufficient. Monitoring is not done just as a procedural step to satisfy the donor. Project staff must remember to regularly analyze the data recorded and, based on the findings, take the next step by adjusting project directions or approaches to improve overall social and environmental sustainability.

9. ***Monitoring plan***. Once indicators have been specified (for the overall project as well as for the specific environmental and social concerns), a monitoring plan should be prepared. This plan considers the source, method, and frequency of data collection, as well as who is responsible for both collection and analysis. The plan also should consider how the data will be reported and used to inform future decisions.

   Each indicator must be precisely defined: how the "Adoption of recommended practices/technologies by men, women, and other disadvantaged groups" will be measured, or "Changes to carrying capacity of pasture areas and rangelands" and what units of measurement will be used. The plan also should define with what frequency each indicator will

be measured and, to ensure consistency and comparability of the data, from where the data will be collected (for example, district health center records) and by whom.

For environmental issues, the EA/EIA or the EMP may be a useful resource for specifying the relevant environmental indicators to monitor during project implementation and the requirements for doing so. These instruments play an important role in monitoring environmental impacts during a project and after its completion.

The budget for monitoring of all aspects of the project or process must also be considered. Is there a dedicated M&E officer? Are beneficiaries or local stakeholder institutions expected to carry out monitoring? One would hope that M&E of the social and environmental sustainability would not entail significant additional costs, however, this should be considered at the outset.

4. Introduction to Indicators of Sustainability

Indicators are the building blocks of an effective M&E system. They are, however, highly context specific and uniquely representative of a particular program or project.

Appendix 1 presents 11 matrices of sample indicators of environmental and social sustainability, organized by ARD subsector, of potential environmental and social changes that may be observed at outcome and impact levels as a result of a program/project being implemented. The indicators have been formulated in neutral mode primarily to avoid being prescriptive, but also because changes or trends proceed in different directions depending on the intention of a particular program/project. It is the task of the project design team to specify the "preferred" or "intended" direction of change of key environmental or social variables that will be affected by the project (expressed as goal and objective statements).

The sample outcome and impact indicators may be used in specific combinations or adapted to suit the particular project context to help assess the quality of project outcomes on various social groups or regions/areas of concern. It is important to stress that the sample indicators aim primarily to raise awareness and guide the identification of appropriate indicators of environmental and social sustainability of a program or project. They are not to be taken as blueprints. Clearly, local conditions and the specifics of the project context must be the basis for indicator development.

Consideration should be given to whether every indicator selected is relevant (does it provide the necessary information for making decisions?), understandable and meaningful for relevant stakeholders, and feasible (does the project or do stakeholders have the time, skills, and means to monitor it?).

It also is worth considering the sensitivity of indicators—that is, will an indicator demonstrate a short, medium, or long-term change? While the last may be useful for the stakeholders, a project timescale of only a few years needs shorter-term indicators to be able to record changes and to fine-tune activities as necessary.

5. Introduction to the Tools and Methods for Incorporating Environmental and Social Concerns into Projects and for Monitoring & Evaluation

5.1. World Bank Assessments

Box 5.1 describes the key assessments during project preparation and appraisal that assist in ensuring the environmental and social soundness and sustainability of investment projects.

Box 5.1 WB Social and Environmental Assessments

Environmental Assessment

Environmental assessment (EA) covers a project from cradle to grave. During project preparation and before appraisal, the borrower prepares an Environmental Assessment report. Its purpose is to identify potential negative environmental impacts of a project and how to avoid or mitigate them. WB's environmental policy makes EA mandatory for investment projects. In addition, legislation in most client countries requires EIA procedures, which should be reviewed and approved by the authorities. The borrower is responsible for carrying out the EA report with the assistance of the WB. Both also review its findings and recommendations. The EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The EA also may include an environmental monitoring plan for the post-project period. In the M&E system, the implementation of the Environmental Management Plan, the operational part of the EA, should be monitored and evaluated.

Source: WB Operational Policy (OP) 4.01. Environmental Assessment 1999.

Social Analysis

Carried out during project preparation and appraisal, social analysis focuses on the opportunities and constraints, and the likely outcomes, impacts, and risks of a project. It asks whether the social benefits and outcomes of the project have been made clear and then determines whether the opportunities offered by the investment outweigh the social costs. It also assesses alternatives to the project and provides inputs to feasibility studies and design.

The social scientist's role does not end with project appraisal. Social science practitioners make and apply decisions about the social dimensions of the project at many points during the project.

Source: WB "Social Analysis Sourcebook" 2003.

Social Assessment

Social assessment (SA) uses a mix of qualitative and quantitative tools to determine the likely social impacts of a project on stakeholders—and the likely effect of stakeholders on the project. SA is carried out as participatory research during project preparation and as an ongoing process to enable the involvement of beneficiaries and affected persons during implementation. SA takes account of the views and preferences of affected people and other stakeholders to improve the design of a project and to establish a participatory process for project implementation and monitoring.

The WB clears the terms of reference and reviews the findings of any social assessment carried out during preparation.

Source: WB "Social Analysis Sourcebook" 2003.

At the country level, Country Social Analysis (CSA) and Country Gender Assessments (where available) also provide valuable background information on the social and political context of a program/project.

5.2. Other M&E Tools and Methods

Appendix 2 presents the individual fact sheets on some of the recommended tools and methods that are deemed ***practical for fieldwork application***. Not all of the options listed as possible tools and methods to use have been detailed into fact sheets. Only the tools and methods that meet the criterion of practicality for M&E applications, taking into account the resource constraints in the field for project M&E work, have been detailed in the fact sheets. Case studies of the actual application of the tools/methods on completed or ongoing programs/projects have been included to demonstrate current practice and experience with the use of the tool/method.

Table 4.1 Fact Sheets on Tools and Methods Detailed in Appendix 2

No.	Tool/method	M&E application
1	Sample surveys	Often considered the default method for M&E, sample surveys provide comprehensive vital information about the target population. Doneproperly, sample surveys lead to conclusions about the entire population based on trends and patterns of change within the representative sample. Sample surveys often are used for socioeconomic studies, and for ex-ante, baseline, and ex-post evaluation of projects.
2	Case studies	A good complement to methods involving larger samples such as surveys, case studies document the life story or sequence of events over time related to a person, location, household, or organization to obtain insight into a project's impact. The need for a focused case study can arise from a general survey in which a particular issue emerges a needing more in-depth elaboration. Case studies can provide interesting perspectives that one can gain only through a closer look at the overall situation (or life story) of a person, household.

Table 4.1 *continued*

No.	Tool/method	M&E application
3	Key informant interviews	One-on-one talk about a specific topic or issue with an individual recognized or designated as a community or institutional leader. The aim is to learn the key person's views and perceptions of the program or activity, planning or development process, and political setting in which work is being done. If triangulated with other methods, key informant interviews often provide more detail on the political or emotive aspects of an issue than are easy to elicit or discuss in a public meeting.
4	Focus group discussions	Means to gather people from similar backgrounds or experiences to discuss a specific topic of interest. The group is guided by a facilitator, who introduces the topics and encourages full participation. Focus groups elicit a multiplicity of views within a group context in a way that individual interviews cannot (for example, in statistical surveys), or to gather local terminology or beliefs for research purposes. Focus group discussions can be used as an individual monitoring activity or as a complement to other methods, especially for triangulation and validity checking.
5	Community group interview	Series of set questions and facilitated discussion in a meeting open to all community members used to gather views and feedback of beneficiaries and other stakeholders to be used by decision-makers and to disseminate information to the community. Community group interviews enable project managers or community leaders to understand the diversity of opinions within the community and gather feedback quickly on an activity or program.
6	Direct observation	Detailed observation of what is seen or heard on a program site of relevance to an activity. The observer does not become a participant in the activity. Practical tool to gather basic information and to verify the data and opinions gathered via other means. Very useful as a means to report on behaviors, actions, and processes, for example, a change in behavior of extension workers toward ethnic minorities as a result of a project training activity.
7	Stakeholder analysis	A tool to identify which people and organizations may be affected (positively or negatively) by a development activity. A stakeholder is an individual, community, organization, or group that has something to gain or lose through the outcomes of a process or project. Applied in an M&E context, stakeholder analysis assists in identifying all the primary and secondary persons or organizations that

Table 4.1 *continued*

No.	Tool/method	M&E application
		may be impacted by the program, process, or activity, whether they are likely to be positively or negatively affected, and how important or influential they are in regard to the activity.
8	Participatory Rural Appraisal (PRA)	Primarily a planning approach but with M&E applicability, PRA is focused on sharing learning between local people, both urban and rural; project staff; institutional representatives; and outsiders. It not only includes participatory methodologies or tools but also encourages participatory attitudes and behaviors that emphasize local knowledge and enable local people to make their own appraisals, analyses, and plans.
9	Participatory M&E methods: • Community scorecards • Community monitoring committees	Processes through which stakeholders a various levels • Engage in monitoring or evaluating a particular project, program, or policy • Define the purpose and scope of the work, selection of the methods, and gathering and analysis of data • Share control over the content, process. and results of the M&E activity • Make decisions and engage in taking or identifying corrective actions. The focus is on the active engagement of the primary stakeholders. Participatory M&E is a management tool rather than an end in itself.
10	Most significant change evaluation	Based on telling stories about events that people think were important. No need to explain what an indicator is or learn special professional skills. Everyone can participate, and project stakeholders are involved in both deciding the sorts of change to be recorded and analyzing the data. Has been referred to as "monitoring-without-indicators." Can be carried out throughout program/project implementation. Findings are useful for refocusing the activities or removing those that cause negative change during annual planning.
11	Rapid nutrition surveys	Sample survey of children under 5 years to determine prevalence of malnutrition. Useful in assessing project impacts on particular social groups that are especially vulnerable to food insecurity, for example, in poor fishing villages or upland farming communities, or in the aftermath of a natural disaster or calamity. Also useful in establishing the indirect nutritional effects of project interventions on the household, with particular focus on children under 5. Changes in the

Table 4.1 *continued*

No.	Tool/method	M&E application
		level of malnutrition can be measured at intervals of three years for 6-year projects and of five years for 10-year projects.
12	Seasonal food availability analysis	Participatory method for assessing local-level food security risks and malnutrition among children. An alternative to rapid nutrition surveys, this method involves a participatory survey of villagers or members of a community on incidences of food availability/ scarcity, and brief, structured interviews of mothers regarding risks to their children's health and nutrition. Useful for drawing insights of affected groups as to whether project activities or interventions have led to the scaling-up or mitigation of risk factors or conditions with respect to food security in the household or community.
13	Social impact assessment	Methodology to assess any significant improvement or deterioration in people's well-being or any significant change in an aspect of community concern. Aims to assess the qualitative effects on people and their relationships; determine issues of concern; improve communication, understanding, and involvement; and ensure environmental justice. Widely applied in feasibility and planning studies, SIA can be applied during project implementation for ongoing monitoring of project outcomes and impacts on affected social groups. Useful to undertake a follow-up SIA at project mid-term and at completion if a pre-project social assessment has been carried out.
14	Gender analysis	Structured approach to understanding and documenting the differences in gender roles, activities, needs, and opportunities in a given context. Involves the disaggregation of quantitative data by gender and highlights the different roles and learned behavior of men and women based on gender attributes. Comprehensive gender studies are applied primarily in policy development and program/project planning. However, aspects of gender analysis also is may be applied in M&E—for intermittent monitoring of gender implications of project activities/outcomes—by using simple techniques such as direct observation, focus groups, and time-use studies.
15	Institutional analysis	Useful in assessing whether project is effectively addressing capacity or structural limitations of the implementing agencies (public and private, formal and informal). Also identifies (so helps remedy) organizational limitations in fostering greater

Table 4.1 *continued*

No.	Tool/method	M&E application
		participation by disadvantaged groups (women, ethnic and indigenous people). Another practical application is in understanding the dynamics and influence of existing local or grassroots organizations and social networks, and how the project is effectively tapping into this. For intermittent monitoring, can be carried out using simple techniques such as focus groups, community group interviews.
16	Environmental Assessment (EA)/ Environmental Impact Assessment (EIA)	Evaluates project's potential environmental risks and impacts in its area of influence; examines alternatives; identifies ways of improving project selection, siting, design, and implementation by preventing adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating adverse impacts throughout project implementation. EIA is a very similar procedure but is enforced according to national laws and requirements.
17	Environmental Management Plan (EMP)	Steers project's works for due environmental consideration and best practices as an appendix to major work contracts. Helps to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels; also assigns responsibilities to stakeholders.
18	Environmental audit	Determines the nature and extent of all environmental areas of concern at an existing facility, usually an industrial site. Identifies measures to mitigate the areas of concern, estimates the cost of the measures, and recommends a schedule for implementing them.
19	Environmental Action Plan (EAP)/National Environmental Action Plan (NEAP)	Describes a country's major environmental concerns and causes of problems, and formulates actions to deal with them as a particular strategy, policy, plan, or program, or a series of projects for a particular region. Aims to guide all related programs toward a common goal.
20	Participatory environmental monitoring	Develops partnerships of multiple stakeholders for efficient, effective, and socially inclusive monitoring of the environment. Useful for collecting local observations of environmental changes based on practical indicators that the local community understands and is familiar with. To be effective, must be designed into the project M&E system from the beginning and based on a clear framework of what is to be monitored and the methods of ecological assessment that will be applied by the local communities.

Table 4.1 *continued*

No.	Tool/method	M&E application
21	Indigenous land units/ Participatory mapping	Combines indigenous knowledge with scientific tools (for example, GPS and GIS) and interpretation to produce an evolved form of community mapping well understood by the stakeholders. Can be used for both planning and monitoring. Employs participatory techniques and draws on local communities' indigenous knowledge. Has the ability to focus the attention of community members on environmental and land management issues. However, requires careful planning and significant resources to undertake.
22	Participatory forest survey	Participation by community members in planning and implementing forest surveys with professionals from respective government and/or other organizations. Planning includes selection of survey methods, and characteristics to be measured and recorded. Used to learn as much as possible about every part of the forest (for example, boundary markers, different land-use practices) and how the forest will perform if a number of management options are instituted. Provides useful baseline knowledge that can be revisited during monitoring to see changes.

Source: Authors.

Appendix 1. Sample Indicators for Agriculture and Rural Development Subsectors

A. Agricultural Policy
B. Agricultural Research, Extension, and Education
C. Agro-enterprise and Forest-Based Enterprise Development
D. Fisheries Management and Development
E. Forestry
F. High-Value Agriculture
G. Land Policy and Administration
H. Livestock Development and Rangeland Management
I. Rural Finance
J. Rural Infrastructure
K. Smallholder Agriculture

A. Agricultural Policy

Typical subcomponents of WB-assisted projects/programs:

- Export development and competitiveness (particularly for high-value agriculture)
- Subsidi es (market price support for inputs and outputs)
- International trade regulations (sanitary and phytosanitary standards [SPS], biotechnology)
- Support services (including research and extension agricultural inputs such as fertilizers and chemicals, seeds marketing assistance)
- Rural financial intermediation
- Institutional reform ((privatization of state-owned enterprises (SOEs), institutional restructuring, cooperatives and producers' associations, and private sector participation))
- Environmental and labor standards in agriculture.

Relevant objectives of policy setting in the agriculture/rural sector include increasing incomes of rural producers (particularly smallholders) and ensuring food security; transforming inefficient farms, markets and state-owned enterprises; liberalizing trade and increasing competitiveness; encouraging private sector participation; adding greater value to primary commodities; improving the supply of and access to rural credit and support services; and improving the efficiency and effectiveness of government agencies.

Box A1.1 Environmental and Social Considerations, Agricultural Policy
(*Refer also to other subsector matrices***.)**

Environmental Issues

- National or sectoral policies that promote short-term, minimum-cost exploitation of agricultural, forest, fishery, and other natural resources (includes policies on land-use planning by communities)
- Promotion of cultivation of less suitable crops that require extensive amounts of water, fertilizers, pesticides, or space; or the processing of which require great energy or pollute the environment if proper methods are not applied (for example, coffee, cotton, cocoa, oil palm, rice, sugar, and tea); or that do not nourish a starving population (tobacco, cash crops)
- Modification of natural species diversity as a result of the transformation to monoculture practices
- Use of unacceptable agrochemicals

Socioeconomic Issues

- Weak legislative framework and regulatory/administrative systems for pursuing market reforms
- High level of protection of domestic agricultural production, for example, subsidies such as market support prices on inputs and outputs that limit the commodities' competitiveness in the world market
- High level of protection (import tariffs, quotas, border restrictions such as product standards, price and input subsidies) accorded to primary agricultural produce in developed countries such as the U.S. and in Europe that bar market entry to agricultural exports from developing countries
- High levels of subsidies, particularly those that vary with the scale of production, that have had detrimental environmental effects by stimulating overproduction either through switching to more intensive production techniques or extensifying production onto marginal lands and environmentally valuable areas. Overproduction has negatively affected land use, soil, and water quality (from high input use), biodiversity, and landscape.
- Limited institutional capacity and resources in developing countries to meet the import requirements (volume, timing, and quality) of industrial countries for agricultural produce
- Dominance of small (often asset-poor) producers in developing countries who usually are disorganized and fragmented
- Long dependence on the State to direct, provide services to, and regulate farm production and marketing
- Lending to small, asset-poor farmers considered high risk and low return
- Risk of project benefits being captured by well-off members of the community at the expense of targeted rural poor groups unless interventions are well targeted and selection criteria are clear and transparent
- Temporary or permanent loss of livelihoods as a result of farm restructuring, especially for women-headed households and other disadvantaged groups

Box A1.1 (*continued*)

- Poor preparedness for exceptional food shortage caused by natural hazards
- Access to employment and other opportunities (for example, market spaces, credit) by women and other disadvantaged groups
- Nonrepresentation in political bodies and decision-making of the interests of disadvantaged groups (including women, landless or asset-poor farmers, indigenous populations, ethnic minority groups)
- Role of NGOs and other civil society groups in mobilizing communities and disadvantaged groups
- Child labor in agriculture

Source: Authors.

Table A1.1 Indicators of Social and Environmental Sustainability, Agricultural Policy

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Sustainability implications of agricultural policies – *Incentives (property rights, pricing, subsidies)*	***Refer also to Land Policy matrix.***				Changes to land use over time, such as conversion of forests and lands of ecological value for agriculture Changes to bio-diversity (domesticated and wild species) Fragmentation of natural habitats in agricultural areas Changes to extraction of water from surface and groundwater sources Changes to soil and water quality over time from pesticide and fertilizer usage Share of agriculture greenhouse gas (GHG) emissions Maintenance of environmental services through carbon farming and biodiversity conservation Changes to food production or supply patterns as a result of the shift to high-value farming	Area and types of land use Affected/ threatened species areas of valuable habitats under threat Use of water, inorganic fertilizers, and agrochemicals per unit area over time Soil and water quality Estimated net GHG emissions from the agricultural sector Proportion of food requirements met from local production	State-of-the-environment reporting Statistics and records of agricultural and environmental authorities Views of environmental authorities and NGOs
	Legal framework and administrative system formalizing property rights of men and women devolution of ownership and control of local resources to communities Support to develop transparent mechanisms for allocating resource use rights (for example, fishing rights, customary rights) Policy recommendations on existing subsidies (for example, market price support for inputs and outputs)	No. of individual and joint titles issued to men and women	Numbers	Land registry statistics			
		Stewardship titles and other forms of communal contracts issued to indigenous and nonindigenous communities for community-based management of forestlands	Access and user rights to communal resources Performance against agreed management framework	Field surveys Farmer interviews and local leaders			
		Farm-level investments in physical capital and land improvements (for example, soil conservation) and subsequent improvement in farm productivity	On-farm environmental improvements Productivity (crop yields or livestock units per unit area)	Field surveys Farmer interviews and local leaders			
		Agricultural Intensification (efficient use of land) or extensification (expansion in area or enterprise) of agricultural production	Enterprises (crop/livestock) per unit of land Growth in area under agricultural production	Statistics Field surveys			
		Diversification of agricultural output toward high-value products	Enterprise mix Farm productivity and returns	Farm business analysis Field surveys			

Table A1.1 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Trade and competitiveness	***Refer also to High-Value Agriculture matrix.***				Poor, small farmers engaging in high-value farming and contributing to the volume of nontraditional agricultural exports over time Improvements in productivity and farm revenues, and stability in family labor employment over time	Proportion of agricultural exports supplied from smallholder farms Long-term yields/ productivity Structure and level of farm incomes over time No. of weeks/year employed in on-farm and off-farm activities	Farm-level cost and returns analysis Farmer interviews Focus groups
	Legal framework and regulatory systems developed for food safety and agricultural health standards (or SPS standards), particularly for fish, and horticultural and animal products	Regulatory systems in place for promoting or enforcing environmental, labor, and food safety standards among commercial farms and producers' groups, processing firms, input producers/suppliers	Institutional capacity (staff, resources) Operational coverage	Institutional analysis Administrative records			
	System of border control, monitoring, and surveillance established to protect against foreign animal and plant pests and diseases	Level of awareness of international trade regulations among producers' groups and commercial growers targeting the export market	Knowledge of regulations and standards	Focus groups PRA			
	Capacity building for public and quasipublic agencies to enforce and monitor standards at industry/ enterprise level	Producers' groups and commercial growers, processing firms, and input producers/suppliers applying production systems based on local environmental and labor standards and international	Numbers Compliance with standards Worker safety Wage levels and conditions by gender	Administrative records Inspection visits by relevant authorities Farmer interviews, suppliers, processors			

Table A1.1 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Support services (training, information campaigns) provided to assist producers' groups (inclusive of poor, small farmers) in meeting international trade regulations Skills training and capacity building for public agencies to participate in the global marketplace (for example, WTO)	food safety standards Poor, small farmers (men and women, ethnic and indigenous) participating in agricultural supply chains	Numbers and volumes of production	Administrative records Records and statistics of local authorities			
Agricultural innovations (research and development; biotechnology)	Agricultural research systems incorporate environmental/ social issues in the research agenda Research into, and development of technologies/ practices/plant or animal species that adapt well to climate change, taking into consideration local knowledge and indigenous systems	Regulatory framework in place for regulating the development and commercialization of biotechnology	Institutional capacity (staff, resources) Technology packages certified	Institutional analysis Administrative records	Changes to farm/ enterprise productivity and revenues over time Unknown effects on environment and living beings of long-term application of biotechnology	Output per unit area Environmental and health effects of biotechnology over time	Field surveys Longitudinal surveys Ecological assessment
		Mature biotechnology and other agricultural innovations that are environmentally benign and socially acceptable (as well as cost effective) developed	Technology packages certified	Administrative records Interviews of key informants			
		Farm- and enterprise-level applications of biotechnology	Extent of adoption/ nonadoption	Farmer interviews/ entrepreneurs			

Table A1.1 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Resource management (technology, practices)	Legal and regulatory framework for biotechnology development and dissemination	Productivity and revenue improvements and environmental/social effects from biotechnology	Output per unit area Environmental and health effects	Field surveys Case studies Ecological assessment			
	Public information and awareness-raising campaigns on the risks and benefits of biotechnology	Private sector providers of biotechnology packages and support services	Services provided and coverage areas	Industry statistics Farmer interviews and key informants			
	Please refer to the individual subsector matrices for specific indicators applicable to different forms of agricultural production and processing systems.				% contribution of agriculture to GDP % contribution of agriculture to exports Rural population density (per sq km of arable land) % of total employment in agriculture Ecological footprint (land area required to support a particular spatial unit such as a community, region, or country) Nationally protected areas as % of total land	Dependence on natural resources for economic growth Hectare (ha) in cultivation per capita	Land use and population statistics
	Production and processing technologies/ practices promoted that are environmentally benign or beneficial Technologies/ practices developed and promoted to adapt to climate change Support (training, equipment, credit) provided for proper farm waste handling/disposal or recycling	Change in awareness among men and women farmers (smallholders, commercial growers) and agricultural entrepreneurs of environmental implications of farming/ fishing/ forestry/ processing practices	Knowledge of local environmental issues Perceptions of men and women	Focus groups PRA			
		Farm- or HH-level adoption of sustainable farming/forestry/ fishing practices, including alternatives to input-intensive practices	Extent of adoption or nonadoption among men and women farmers Farm-level cost/ benefit analysis of farming practices/ technology	Field surveys Case studies PRA			

Table A1.1 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Adoption of climate change adaptive technologies/ practices	Extent of adoption/ nonadoption	Field surveys Farmer interviews	Contribution to, mitigation of, and adaptation to climate change		
		Adoption of technologies/ practices using biomass and biogas as energy source for other farm enterprises	Extent of adoption/ nonadoption	Field surveys Farmer interviews			
Other institutional aspects (in addition to those listed above)	Legal framework and administrative systems for environmental, labor, and food safety standards Support and capacity building for producers' groups to organize and manage their affairs Broad consultation and awareness-raising on policies and plans inclusive of poor households, men and women farmers, indigenous and ethnic groups	Change in awareness of environmental concerns among the general public, sector players	Knowledge of environmental issues	Key informant interviews Perceptions of men and women	Self-sustaining, functional producers' groups supporting large and small growers and providing services to its members	Capacity and performance of producers' groups	Key informant interviews Farmer interviews
		Functional producers' groups established and supporting the interests of its members, including small men and women farmers, and other disadvantaged groups	Membership structure Services delivered to members	Administrative records Key informant interviews			
		Network of business service providers supporting both men and women entrepreneurs, large and small farmers, and other disadvantaged groups	Services provided Service coverage	Administrative records Key informant interviews Case studies			

Table A1.1 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Social well-being	Criteria and guidelines for project support (credit, training, extension) clearly target women, young people, indigenous and ethnic groups, and poor households Training and capacity building for small farmers to enter into, and manage, beneficial contract farming arrangements Alternative livelihoods (off-farm and nonfarm) promoted particularly for poor households, women, and ethnic and indigenous groups	Crop yields, marketable surpluses, and enterprise returns of small and marginal farmers, including female-headed and asset-poor HHs	Production capacity of small and disadvantaged farmers	Farm-level cost and returns analysis	Changes in productivity and incomes of women and other disadvantaged groups from diversification or high-value farming over time Wage and conditions equality for men, women, and at-risk groups for comparable capabilities and skills Health risks to farm workers and nearby communities from intensive application of agrochemicals Empowerment of women, poor households, ethnic and indigenous groups from increased economic participation	Crop yields and contribution to HH incomes Wage levels and conditions by gender Incidence of related health problems Perceptions of men and women	Farmer interviews Case studies Administrative records Statistics Community health surveillance
		Changes in incomes and family labor employment of farmers and their households engaged in beneficial contract farming arrangements with commercial or industrial producers	No. of farmers Farm-level outcomes of contract farming	Project MIS Sample surveys Case studies			
		Diversification of livelihood activities (from staple crops to cash crops, livestock, off- and nonfarm)	Sources of income (cash and noncash) at HH level	Sample surveys Case studies			
		Women entrepreneurs in farming, agroprocessing, or marketing activities	Number and % of total beneficiaries	Project MIS Sample surveys Case studies			

Sources: OECD 2002; Pearce 2002; Sida 2002; Earth Council N.d.; World Bank 2005b, World Bank ESSD Environment Dept. 2006.

B. Agricultural Research, Extension, and Education

Typical subcomponents in WB-assisted projects:

- Agricultural research centers and programs
- On-farm research programs
- Agricultural extension including promotion of demand-driven services and pluralism in service providers and methods
- Agricultural education (vocational or higher education).

WB-supported agricultural research and extension projects typically focus on two objectives: (1) institutional development to strengthen the institutions and technology transfer system necessary to develop and disseminate improved technologies and management practices in the agricultural sector; and (2) productivity change due to technological innovation or more sustainable methodologies introduced through the technology system (Rajalahti and others 2005).

Box A1.2 Environmental and Social Considerations, Agricultural Research, Extension, and Education

Environmental Issues

- Weak or nonexistent provisions for dialogue between agricultural researchers and environmental experts/authorities.
- Lack of environmental expertise in educational institutions.
- Preference given to economic values at the expense of environmental and social values
- Preference given to high-value technical solutions, medications/chemicals, and machinery instead of appropriate technology. This choice tends to favor richer farmers and may leave a larger environmental footprint.
- Natural conservatism of subsistence farmers makes them reluctant to take risks with new technology; therefore, introduction of new ideas takes time (for example, conservation farming, agroforestry).

Socioeconomic Issues

- Weak or nonexistent provisions for dialogue between farmers and agricultural researchers
- Usually very little on-farm research (tends to be institution-based); therefore, research does not respond to needs of subsistence farmers
- Frequent cultural and language barriers between researchers and farmers, meaning that each group does not value the work of the other

Box A1.2 (*continued*)

- Barriers (cultural, legal, language, bureaucratic processes) to women farmers or female-headed households, as well as members of indigenous or ethnic groups to participate in extension and training opportunities
- Extension workers usually trained in agricultural technology but lack skills in market linkages and value-chain adding, which have the potential for sustaining farm/HH incomes
- Content and methods of agricultural extension often not in line with specific needs of target groups, especially among disadvantaged groups with poor literacy
- Teaching skills of agricultural educators and extensionists often very top-down, giving insufficient opportunity to include local knowledge and skills of farmers; and too theoretical—insufficiently hands-on
- Isolation (for example, physical, social, political) of indigenous peoples and ethnic groups from the rest of the population
- Impact of sickness and death from HIV/AIDS and malaria limit free time available to farmers (particularly women) to attend training and cause a loss of agricultural skills and knowledge
- Death from HIV/AIDS-related illnesses causing loss of highly trained staff and harming capacity building in institutions

Source: Authors.

Table A1.2 Indicators of Social and Environmental Sustainability, Agricultural Research, Extension and Education							
Critical sustainability issues	**Component and activity level (output indicators)**	**Project development objective and component level (outcome indicators)**	**Measurement/ assessment**	**Tools/ methods**	**Development goal level (impact indicators)**	**Measurement/ assessment**	**Tools/methods**
Environmental considerations in agricultural research, extension, and education	Environmental issues investigated in agricultural research.	Farmers adopt environmentally sustainable agricultural technologies and practices. (supporting indicators: farmers practicing composting, multiple cropping, intercropping, rotations, biological control, IPM. ***(See Smallholder Agriculture matrix.)***	Knowledge of local environmental issues Farm-level application of sustainable farming practices	Focus groups Field surveys	Overall benefits from adoption of technologies resulting from research programs, for example, environmental benefits of sustainable farming practices at farm level vis a vis effects on yields and overall profit margins over time	Environmental assessment included in research design Farm-level environmental and economic assessments	Review of research results Sample surveys Case studies
	Extension activities (training, farm trials) incorporate environmental implications of farming practices and technologies.						
	On-farm research trials establish optimal levels of fertilizer and water use for crops under local conditions.	Farmers understand and apply optimal levels of inputs. Strengthened relationships among farmers, researchers and extensionists.	Crop production results with respect to inputs/technical recommenda-tions	Farmer interviews Research results			
	Environmental issues included in agricultural education curricula.	Increased capacity of extension staff to address environmental implications of farming practices and technologies.	Environmental content of extension materials Responses to field problems	Review of extension materials Farmer interviews and extensionists			

Table A1.2 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Participation in project activities and project opportunities/ benefits	Women, members of indigenous peoples and ethnic groups trained as extension staff	Women, indigenous peoples, and ethnic groups employed as extension agents and effectively deployed in the project area.	Number or % of total Current deployment	Project MIS or administrative records	Improved productivity (in farming/fishing/ forestry) of poor HHs, especially female-headed HHs, and other disadvantaged groups Workload, time or cost savings from improved practices and technologies, especially for women and disadvantaged groups Dissemination of indigenous or traditional practices that protect or conserve resources	Yields or outputs Comparison of results with existing practices and technologies Uptake of indigenous/ traditional practices	Sample surveys Case studies Gender analysis
	Access to all project training and capacity building opportunities by men, women, and other disadvantaged groups	Adoption rates of recommended practices/ technologies by men, women, and other disadvantaged groups.	Extent of adoption or nonadoption	Project MIS Sample surveys Case studies PRA			
	Women and members of other disadvantaged groups obtain agricultural degrees	Women and members of other disadvantaged groups obtaining agricultural degrees employed locally in the sector.	Number or % of total Current employment	Project MIS Tracer studies			
Social considerations in institutional processes	Targeting poor, women and other disadvantaged groups explicit in research and extension budgets, resource allocation, competitive research grants	Women, poor HHs, ethnic and indigenous groups reached by extension. Criteria of incorporating needs of the poor, women, and other disadvantaged groups in research programs or in technologies that result from specially targeted research programs.	Numbers or % Treatment of social considerations in institutional processes	Extension records Farmer interviews Review of research proposals and results	Productivity (farming/fishing/forestry) of men and women farmers, poor HHs and other disadvantaged groups	Yields or outputs	Sample surveys Case studies

Table A1.2 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Appropriate technology (research and extension)	On-farm trials address target groups' needs and views through participation of women and members of other disadvantaged groups	Research activities respond to specific needs of women and other disadvantaged groups.	Specific target groups of research	Project MIS; Case studies	Both new and improved traditional technologies introduced and producing sustainable on-farm results	Yields or outputs Comparison of results with existing practices and technologies Perceptions of farmers and extensionists	Sample surveys Case studies
		Appropriate technologies developed for specific needs of women and other disadvantaged groups.	Implications on workload	Sample surveys Case studies			
		Appropriate technologies incorporate indigenous knowledge or traditional practices that protect or conserve resources	Implications on resource management	Case studies			
		Extension messages and training programs targeted at women and disadvantaged groups; extent of application	Extent of adoption or nonadoption	Project MIS Sample surveys Case studies			

Table A1.2 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Participatory, culturally appropriate and practical training techniques employed	Extension messages more easily understood and accepted by farmers	Extent of adoption or nonadoption	Project MIS Sample surveys			
		Extension workers confidently improving and transferring new and traditional technologies	Dissemination/ use of appropriate farming technologies	Sample surveys Training and extension evaluation forms			
Impact of HIV/AIDS on agricultural education and extension	Measures to limit impact of HIV/AIDS and malaria implemented	Labor-saving techniques in use on farms	Extent of adoption or nonadoption	Sample surveys	Maintenance of highly trained national agricultural research, management, and education staff	Ratio of staff to farmers/students in agricultural departments, research and educational institutions	Administrative records
		HIV/AIDS strategies prepared and implemented in educational and research institutions	Morbidity and mortality rates of teaching or research staff	Health records			
	HIV/AIDS and malaria prevention and treatment messages provided in institutions and as part of agricultural extension work	Students and farmers understand means to prevent and treat HIV/AIDS and malaria Changes in morbidity and mortality due to HIV/AIDS or related diseases	Morbidity and mortality rates of students and farmers	Health records			

C. Agro-enterprise and Forest-Based Enterprise Development

Typical subcomponents in WB-assisted projects:

- Agro- and forest-based enterprises (small- and medium-scale)
- Agro-industries (large-scale)
- Training (enterprise management, technical skills).

Agro- and forest-based enterprise development is aimed largely at promoting overall economic growth and improving socioeconomic well-being (including reducing poverty) through adding value to agricultural commodities and generating off-farm employment and income.

Box A1.3 Environmental and Social Issues, Agro-Enterprise and Forest-Based Enterprise Development

Environmental issues

- Degradation of water bodies due to discharge of polluting wastes from facility complex (such as pulp mill or agroprocessing plant). These effluents typically have high biochemical oxygen demand (BOD), chemical oxygen demand (COD), and suspended and dissolved solids, hydrocarbons, alkaline or acidic compounds, and other organic constituents.
- Exacerbation of solid waste problems in processing plant areas.
- Air pollution and gaseous and odor emissions to the atmosphere from processing operations.
- Accidental release of polluting or hazardous solvents from the plants.
- Environmental problems related to transportation of raw materials and products,
- Provision of roads and easy access to processing and markets, in combination with lack of long-term planning and socioeconomic pressure, may lead to over-exploitation of natural resources.
- Deforestation.

Socioeconomic issues

- Provision of roads and easy access to population centers or processing plants may lead to both improved standard of living (for example, access to jobs, schools, and health care) and social risks (for example, prostitution, alcoholism)
- Violations against the rights of indigenous people to resources and land rights
- Access by women and other disadvantaged groups to employment and other project opportunities (for example, credit, market spaces, subcontracted processing tasks)

Box A1.3 (*continued*)

- Occupational health risks due to dust, noxious materials-handling, noise or other process operations, and safety of workers in factories/plantations
- Constraints (cultural, skills, legal rights, bureaucratic processes) faced by women and other disadvantaged groups to own, manage, or work in enterprises
- In-migration of people drawn by employment prospects
- Increase in women's "double burden" of productive and reproductive responsibilities, and reduction of female labor availability for on-farm agricultural production
- Health risks from food- and water-borne health hazards due to either no knowledge of hygienic practices or poor infrastructure
- Health risks from agrochemicals due to either lack of knowledge of good agricultural practices
- Risks from animal and plant pests and diseases due to a country's lack of capacities for border control, monitoring, and surveillance
- Risks of loss of or limited access to export markets due to inadequate capacities to manage sanitary and phytosanitary hazards
- Constraints (knowledge, resources, capacities) faced by smallholders to meet quality and safety standards and participate in agribusiness

Source: Authors.

Table A1.3 Indicators of Social and Environmental Sustainability, Agro-Enterprise and Forest-Based Enterprise Development

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Refer also to Agricultural Policy matrix.							
Environmental impacts of enterprise operations	EIA- or EMP-recommended measures implemented at enterprise level, for example: • Waste disposal measures • Wastewater treatment measures • Odor and other air emission controls • Recycled organic wastes Compliance with mandatory local/national environmental permits or clearances No. of enterprises supported with environmental awareness and other training Public awareness and education campaigns on hygienic practices, good agricultural practices	Disposal of solid and hazardous wastes at enterprise level in accordance with acceptable standards	Volume of waste Manner of disposal vis à vis local/national regulations	Factory/site visits Review of internal reports (enterprise level) Community monitoring committees Local authority reports Interviews of enterprise or plant managers Compliance reports	Environmentally sound operations of enterprises and businesses (for example, in situ environmental impacts reduced or adequately managed; wastes minimized or recycled; efficient technology) Effects over time of agricultural intensification (to support raw material requirements of enterprises): • Permanent loss of forest land due to land conversion • Changes to biodiversity • Revegetation of degraded lands • Changes to soil and water quality over time from high input use	Enterprise-level environmental performance Forest areas converted Degraded lands put in productive use Affected/threatened species; areas of valuable habitats under threat Use of water, inorganic fertilizers and agrochemicals per unit area over time Soil and water quality	Environmental audit of enterprises Local authority compliance reports Land registry statistics Ecological assessment Soil and water quality analysis
		Adoption and implementation of Hazard Analysis and Critical Control Point (HACCP) system	Extent of adoption/ nonadoption				
		Recycling/reuse of organic wastes such as residues from processing used for fuel or animal feed.	Extent of recycling/reuse by enterprise itself or other users				
		Wastewater treated to acceptable standards	Treatment standards vis à vis local/ national regulations				
		Odor and emissions controlled at acceptable thresholds	Presence and quality of odor; Emissions such as particulates and gaseous toxins				
		Enterprises implementing food safety management measures to protect against food- and water-borne health hazards	Extent of adoption/ nonadoption				

Table A1.3 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Changes to demand for local resources (trees, biomass) as sources of energy for enterprise operations	Energy sources and energy intensity of enterprises Area reforested	Case studies of energy-intensive enterprises Local authority reports			
		Plans prepared by large-scale enterprises for accidental pollution prevention for any possible scenario of pollution incidents	Operative capacity to implement accidental pollution plans	Review of plans			
		Reforestation	Area reforested	Review of plans			
Participation in project activities and opportunities/ benefits	Persons/HHs availing of financial services and training	Women and other disadvantaged groups who have availed themselves of financial services and training, and are running viable agro- or forest-based enterprises	No. or % of total beneficiaries Enterprise viability	Project MIS Sample surveys Case studies	Contribution to annual HH income among female-headed HHs and other disadvantaged groups Nutritional status of children under 5 years old Position of women in HHs in terms of control over finances/resources and decision-making	% of annual HH income Underweight (weight relative to age) or stunting (height relative to age) or wasting (weight relative to height) Perceptions of men and women	Sample surveys Rapid nutrition surveys Case studies Gender analysis
	New enterprises set up with project support (training financial services) and staff numbers	New employment generated in factories/plantations going to men, women, and other disadvantaged groups	No. (or value) of new jobs created for men, women, and members of disadvan-taged groups	Administrative records of firms Project MIS Sample surveys			

Table A1.3 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Women and other disadvantaged groups engaged in viable agro-processing or forest-based enterprises	Changes in productive hours spent by, or earnings of women from HH-level agroprocessing or forest-based enterprises	In comparison with the baseline or as % of total HH income	Sample surveys Case studies			
		Gender division of labor includes women in remunerative activities	Shift in roles between men and women in productive and HH activities	Time-use studies Gender analysis			
	Refer also to High-Value Agriculture matrix.						
Labor standards in factories/ plantations	Enterprise-level information campaigns on acceptable labor standards Entrepreneurs or business operators trained and assisted in occupational health and safety (OHS) issues, corporate social responsibility.	No child labor employed in factories/plantations Light labor only for children in family enterprises	Exclusion of persons below 15 years old (13 years old for light work) from wage employment in factories/ plantations	Participant observation Administrative records	Wage and conditions equality for men and women for positions of comparable content and responsibility	Wage levels and conditions by gender	Administrative records Case studies Labor audits
		Any differences in wage and employment conditions between women and other disadvantaged groups, and men for positions of comparable content and responsibility	Wage levels by gender (assuming comparable capabilities and skills)	Project MIS or administrative records Case studies Labor audits			

Table A1.3 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Occupational health and safety of all workers in factories/plantations in conjunction with local standards and regulations	System or procedures in place	Administrative records Review of procedures vis à vis local/ national regulations			
		Incidence of OHS (OHS) issues; measures taken to prevent future incidents	No. of incidents System or procedures for dealing with OHS issues	Administrative records Training records Review of procedures vis à vis local/ national regulations Case studies			
		Corporate programs implemented to improve women's well-being (for example, health and child-care facilities, literacy classes)	Annual budget allocation Benefits derived by women	Administrative records PRA			
Indirect social impacts					Changes to time available for child-care, house upkeep, and subsistence/ cash crop production	Time allocation for HH and production activities	Time-use studies Gender analysis
					Increased access for previously isolated communities	Incidence of related health and social problems	Community health surveillance Police reports

Table A1.3 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
					Health risks to factory workers and nearby communities from gaseous and particulate emissions, and improper waste handling (for example, pulmonary ailments)	Complaints from workers/ communities Incidence of related health problems	Administrative records Community health surveillance

D. Fisheries Management and Development

Typical subcomponents in WB-assisted projects:

- Sustainable management of capture fisheries
- Freshwater aquaculture and mariculture
- Marketing, processing, and food safety
- Community development, training, and capacity building (cooperatives, community-based resource management)
- Coastal zone management, including creation of marine protected areas (MPAs).

Fisheries management-development interventions typically are aimed to improve productivity to promote overall economic growth and improve the socioeconomic well-being (including reducing poverty) of the target population. Recently, however, the focus has shifted to governance and co-management. Marketing and processing interventions aim to increase earnings by reducing losses and increasing value added through investments, training, and capacity building for the fishing communities. Community involvement in resource management and protection, especially in small-scale fisheries, also has increasingly become a key thrust of responsible fisheries management.

Box A1.4 Environmental and Social Considerations, Fisheries Management and Development

Environmental issues

- Over-fishing damaging natural fish stocks and ecosystems.
- Damaging methods of fishing (explosives, trawling) may cause long term damage to stocks and environment (for example, coral reefs).
- Spreading fish diseases through aquaculture.
- Escaped fish from fish farms may compete with wild stocks and lead to genetically inferior stock.
- Use of wild stocks for seed **[plants? If not, use "fertilization"]** that may affect regeneration of wild fish species.
- Increasing use of wild-caught fish (processed into meal) as a key feed ingredient in producing fish (shrimp, salmon) for human consumption places increasing pressure on ocean fish populations.
- Negative impacts of farmed species on natural species and the ecosystem.
- Water pollution from fish farms, fishing vessels, and processing plants.
- Lack of or poor application of environmental standards applicable to the sector, especially for intensive operations such as fish farms and processing plants.

Box A1.4 (*continued*)

- Establishment of farms, often preceded by environmental destruction (for example, mangrove removal), can have indirect impacts due to loss of water-filtering systems and protection against tsunamis.
- Spread of water-borne or water-related diseases harmful to local human populations (malaria, schistosomiasis, dengue) facilitated by fish culture in ponds.

Socioeconomic issues

- Weak property rights over common fish resources (especially in international areas) resulting in overfishing in marine and inland fisheries.
- Economic over-fishing reducing net benefits to an increasing fishing population, due to expanding exploitation of depleting resources.
- Allocation of rights to access to common property resources in fisheries, for example, fishing licenses and leases over inland fishery resources such as lakes, rivers, or ponds.
- Access to lease of inland fishery resources such as lakes, rivers, or ponds.
- Conflict between industrial and small-scale fishers as industrial vessels encroach on grounds reserved for community fisheries.
- Different access to productive activities according to gender or social status (women mostly involved in processing and marketing activities while men generally responsible for catching fish)—may or may not be a problem.
- Fluctuations in incomes for those relying on fisheries, due to fishing bans, competition, and seasonal fluctuations, decreasing incentive to manage fisheries sustainably.
- Occupational health and safety issues on boats and in processing plants, including exploitation of children.
- Effects on human nutrition especially in poor communities (fish being a relatively cheaper source of protein).
- Aquaculture can provide a steady supply of fish (and income) that ameliorates the fluctuations of capture fishing and can provide environmental benefits.
- Pervasive presence of middlemen who erode fishermen's earnings though providing important marketing, finance, and service functions.
- Spread of HIV/AIDS and prostitution facilitated by itinerant lifestyle of fishers and fish salesmen/women.
- Lack of market information available to individuals and small enterprises.

Table A1.4 Indicators of Social and Environmental Sustainability, Fisheries Development

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Environmental and resource management issues of: *Aquaculture/ mariculture*	Training conducted among men and women on sustainable fish-farming practices Financial and support services (hatcheries) provided promoting the use of sustainable technology and fish-farming practices Environmental standards and required administrative framework established Legal or regulatory framework developed to clarify and establish user and property rights to land and water (marine, inland) resources	Uptake of sustainable fish-farming technology and management practices	Fish production results over time	Project MIS Sample surveys Case studies	Permanent removal of mangroves and wetlands to establish fish farms Changes to fish catches and area fishes over time Pollution of watercourses from cumulative discharges of nutrient-rich water from fishponds Escalation of social conflict around water allocation and use, especially in areas experiencing water scarcity Impact of farmed fish species on natural species and the ecosystem	Extent of loss (area, biodiversity, ecological services) Total catch and area fished Resource assessment Complaints over water allocation/ access Fish catch of natural species over time Loss of/changes to biodiversity	Ecological surveys Interviews of fishers Reports of local authorities and communities Fisheries statistics Reports of environmental authorities Expert's reports FAO FishStat
		Conflicts with other users as a result of increased demand for water for freshwater aquaculture	Resource assessment	Reports of local authorities and communities			
		Pollution of watercourses from fish farms, fishing vessels	BOD, nitrogen, phosphate, suspended solids	Water quality analysis			
		Removal/conversion of mangroves and wetlands to establish fish farms	Extent of loss (area, biodiversity)	Interviews of fishers Reports of local authorities			
	On-farm research trials conducted to develop fish-farming technology adapted to local conditions	Farmers understand and apply optimal levels of inputs	Fish production results over time	Interviews of fish farmers Research results			

Table A1.4 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Biosafety measures developed for transboundary movements of aquatic animals	Risks posed by introduced fish species such as disease and parasite infestation of fish farms, effects on biodiversity	Fish catch of natural species over time Loss of/changes to biodiversity	Interviews of fish farmers Reports of local and environmental authorities			
Capture fisheries1/	Financial services provided to fishers for capital (fishing vessels, gear, equipment) Training provided on appropriate fishing technology, fisheries management, environmental issues Support provided for laboratory services, enforcement Environmental standards and administrative framework established Legal or regulatory framework developed to clarify and establish user and property rights	Changes to fish catches and area fished	Total catch and area fished	Interviews of fishers Fisheries statistics	Changes to fish catches and area fished over time Changes to catch structure over time Changes to fish catch of selected overexploited species Extent of fished and unfished areas	Total catch and area fished Size of fish, species composition, and numbers in catch Total catch and area fished of overexploited species Fishing locations, type of gear used, and frequency of fishing activities	Interviews of fishers Fisheries statistics Expert interviews Maps or GIS-compatible spatial records
		Changes to catch structure (ecosystem health)	Size of fish, species composition and numbers in catch	Interviews of fishers Survey of catch statistics			
		Changes in area and quality of critical habitats (vegetative, estuaries, coral reefs, offshore canyons, soft-bottom habitats)	Faunal composition in seagrass beds No. and area of protected areas (MPAs) Extent of coral cover Ratio of live to dead coral on coral reefs	Reports on habitat inventories			
		Changes to level of land-based pollution	Sources and volume of effluents	Survey of local industries Local authority statistics			

Table A1.4 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	to land and water (marine, inland) resources	Prevalence of traditional fisheries practices	Contribution to sustainable fisheries management	Interviews of fishers and community leaders			
	Protecting or rebuilding overexploited species undertaken Declaration of marine reserves and other forms of closure to protect spawning stocks undertaken	Changes to fish catch of selected overexploited species	Total catch and area fished of overexploited species Status of stocks recruitment	Interviews of fishers Fisheries statistics Expert interviews			
		Extent of fished and unfished areas (that is, spatial patterns of fishing efforts)	Fishing locations, type of gear used, and frequency of fishing activities	Interviews of fishers Maps or GIS-compatible spatial records			
Processing and marketing	Financial and support services (training, laboratories, technology, food safety standards) provided Training on environmental management in processing plants provided Environmental standards and administrative framework established	Pollution of watercourses from fish processing plants	BOD, nitrogen, phosphate, and suspended solids	Water quality analysis of affected watercourses	Pollution of watercourses from fish processing plants	BOD, nitrogen, phosphate and suspended solids	Water quality analysis of affected watercourses Expert interviews (environmental authorities)
		See other relevant outcome indicators under "Health Impacts" below. ***For other relevant indicators, see also Agro-enterprise and Forest-Based Enterprise Development matrix.***					

Table A1.4 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Participation in project activities	Financial and support services (hatcheries) provided promoting use of sustainable fish-farming technology and practices Financial and support services provided to fishers (fishing vessels, gear, equipment, training) promoting appropriate fishing technology, fisheries management Capacity building provided for community-based resource management among fishers' groups and communities	Established and well-functioning fishers' groups, processing or marketing cooperatives, women's groups operating fishing boats, fish marketing and processing enterprises	Management structure; members include women and disadvantaged groups Services provided to members	Project MIS Administrative records Case studies Records of community meetings	Communities actively involved in management (protection/ conservation, production) of coastal zone areas such as marine reserves, wetlands, mangroves based on a management framework/plan; Viable fishers' groups and cooperatives over long term Position of women and other disadvantaged groups in local decision-making Local fishing communities organized to take responsibility for long-term fisheries management	Performance against management framework/plan Relevance/utility of cooperatives over long term Perceptions of men and women Organized action(s) and commitment of time/resources Number of community/ fisheries conflicts	Community monitoring committees Case studies Community interviews Institutional analysis Gender analysis
		Women or other disadvantaged groups in management committees and boards	Membership; positions of leadership; active participation in meetings	Project MIS Administrative records Records of community meetings			
		Involvement of fishing communities in fisheries protection/ management	Commitment of time/ resources by HH members	Project MIS Community boards			
Sharing in opportunities created by, or benefits from, project	Capacity building provided to fishers' groups, processing or marketing cooperatives, women's groups	Incomes stabilized and spread more evenly across year	Fish sold over longer period of year % of harvest sold (less post-harvest losses)	Sample surveys Case studies Cooperative financial records	Income stabilization encouraging improved management	Fish stocks monitoring Number of times or kg of fish eaten per week	Expert interviews (fisheries) Sample surveys

Table A1.4 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Support provided for alternative livelihood sources		Economic position of fishers and families		Changes in per capita fish consumption Fish consumption as a % of total protein consumption Nutritional status of children under 5 years Position of women in households in terms of control over finances/ resources and decision-making	Underweight (weight relative to age), stunting (height relative to age), or wasting (weight relative to height) Perceptions of men and women	Rapid nutrition surveys Case studies SIA Gender analysis
		Poor HHs, women and other disadvantaged groups operating viable fish marketing or processing enterprises	Number or % total beneficiaries	Sample surveys Case studies Project MIS or administrative records			
		Poor HHs, women and other disadvantaged groups engaging in alternative livelihoods over time; contribution to annual HH incomes	Types of livelihoods Economic benefits to HHs	Sample surveys Case studies PRA			
		Women and other disadvantaged groups owning or leasing stalls in markets	% of total market stalls	Administrative records			
		Gender differences in workload as a result of introduced practices or new technology	Shift in roles between men and women in productive and HH activities	Sample surveys Case studies PRA			
		New and total employment or paid labor generated in fish processing factories for local population, including for women and other disadvantaged groups	Number of jobs by social group	Administrative records of firms			

Table A1.4 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Health impacts of fishing boats and processing plants	OHS training and information campaigns undertaken on fishing boats and processing plants	OHS on fishing vessels/ processing plants in conjunction with local/national standards and regulations	System or procedures in place	Administrative records Review of procedures vis à vis local/ national regulations	Incidence of OHS problems among fishers and fish processing workers over time Incidence of water-borne diseases promoted by fish culture in ponds Nutritional impacts of increased availability of fish Social issues such as spread of AIDS, prostitution, alcoholism	No. of incidents In comparison with baseline or in comparison with nonfishing local communities Extent of social problems	Administrative records Health records Community health surveillance Seasonal food availability analysis Local authority reports
		Incidence of OHS problems among fishers and fish-processing workers	No. of incidents System or procedures for dealing with OHS issues	Administrative records Review of procedures vis à vis local/ national regulations			
		No child labor employed on boats or in commercial processing plants Light labor only for children in family enterprises	Exclusion of persons below 15 years old (13 years old for light work) from wage employment on boats/fish farms or processing plants	Direct observation Administrative records			
		Incidence of water-borne or water-related diseases promoted by fish culture in ponds (malaria, schistosomiasis, dengue)	Incidence of diseases	Community health surveillance			

Table A1.4 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Spread of HIV/AIDS, prostitution, alcoholism	In comparison with baseline or in comparison with nonfishing local communities	Health records			
Indigenous peoples and ethnic groups	Legal or regulatory framework developed to clarify and establish user and property rights to land and water (marine, inland) resources Support provided for alternative livelihood sources	Changes to access by indigenous and nonindigenous HHs/ communities to common property resources in coastal and inland fisheries	Reports of barriers to access in inland or coastal fisheries Reports of conflicts with industrial fishers	Case studies PRA	Changes to way-of-life, nutrition and well-being of indigenous peoples and ethnic groups	Practice of traditional fishing practices Results of alternative livelihood sources Contribution to resource management Perceptions of men and women	Case studies SIA
		Traditional fishing practices compatible with sustainable fisheries management	Contribution to sustainable fisheries management	Case studies PRA			

Source: FAO 1999.

E. Forestry Development

Typical subcomponents in WB-assisted projects:

- Institutional development in forest sector
- Development of forest policies and strategies
- Forest law enforcement and governance
- Land-use planning
- Natural forest management
- Plantation development (community and private)
- Reforestation/afforestation
- Agroforestry
- Community-based forest resource management.

Forestry development typically has parallel aims of improving sector productivity for overall economic growth and socioeconomic development, and conserving or protecting natural and environmental resources.

Box A1.5 Environmental and Social Considerations, Forestry Development

Environmental issues

- Inefficient institutional capacities at national and regional levels may lead to uncontrolled use of forest resources.
- Inadequate forest policy and strategy development and poor enforcement of laws and regulations may lead to over-exploitation of forest resources and environmental degradation.
- Lack or poor application of forest certification may lead to unsustainable resources use, violations against local population, and inadequate protection of valuable forest habitats.
- Capacity may be lacking for field inspections to monitor adherence to standards and any required practices, such as for stream-bank buffer zones, reforestation, waste handling.
- Projects may include major infrastructure development, be located at or near an environmentally sensitive area, alter the pattern of land use, or cause land-use conflicts.
- Valuable habitats and biodiversity may be degraded due to disturbance, logging, selective harvesting of certain tree species, forest fragmentation, road construction and damaged vegetation, land surface, and drainage pattern.
- Badly managed forest can be degraded to secondary forest growth, scrub, or wasteland.

Box A1.5 (*continued*)

- Spreading of introduced tree and scrub species may cause disappearance of certain local species that require intact forest cover to regenerate.
- Land degradation including soil erosion, disruption of hydrological cycle, loss of nutrients, and decline in soil fertility may occur due to clearance prior to reforestation.
- Shifting cultivation may follow logging and degrade land if practiced in moist and semi-arid areas.
- Decline of wildlife stocks as a result of habitat fragmentation, fencing (impede migration routes of natural animals), and competing livestock breeding.
- Decreased infiltration and groundwater recharge and increased surface run-off and evaporation may arise due to forest clearing and over-grazing.
- Increased peak and flood flows and surface run-off during rains and snow melt increase soil erosion, landslides, mudflows, and siltation, causing loss of downstream beneficial uses (water supply, fisheries).
- Legal basis may be lacking for enforcement actions in cases of environmental damage or violation of requirements.
- Nontimber natural resources valuable to the local population (fruits, berries, mushrooms, medical herbs, fodder, handicraft materials) may be decreasing.
- Fertilizers, pesticides, and herbicides used in the nurseries and plantations are polluting water bodies.
- Poor forest fire control and capacity for fire suppression may lead to major forest fires.
- By enabling increased levels of atmospheric carbon dioxide, a greenhouse gas, deforestation contributes to global warming.

Socioeconomic issues

- Uncontrolled in-migration and poaching with opening of roads to forest area
- Dislocation or involuntary resettlement of people leading to socioeconomic disruption and decrease in the standard of living of resettled people (particularly, indigenous peoples)
- Loss of historic or cultural features of the land, for example, ancestral lands of indigenous peoples
- Impairment of recreational and ecotourism opportunities
- In-migration of people into the area during establishment and operations of nurseries and plantations
- Land-use pressures from outside forcing local and indigenous population (forest dwellers, tribal people, nomads) depending on intact nature to change their traditional ways of life and sources of income
- Access of indigenous people and ethnic groups to common property resources

Table A1.5 Indicators of Social and Environmental Sustainability, Forestry Development

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Environmental and resource management issues	Sustainable forest management practices (for example, species selection, timber and NTFPs harvesting, fire control) promoted through training, information campaigns, and support services Farmers/HHs/ communities assisted with plantation development, agroforestry, sylvopasture	Adoption of sustainable forest management practices in plantation development, agroforestry and sylvopasture, by communities and private enterprises (for example, using forest certification)	Extent of adoption/ nonadoption Socioeconomic results over time Certified forest resources use	Project MIS Field surveys Case studies	Socioeconomic benefits over time from engagement in community woodlots, forest, and agroforest enterprises Productivity and area of plantations and community woodlots over time	Socioeconomic assessment Timber and NTFPs volumes and areas	Field surveys Case studies Forestry statistics
	Legal and administrative frameworks developed promoting sustainable forest development/ management (for example, EIA, environmental monitoring and compliance, certification systems for forest products, property rights)	Changes to soil fertility and vegetative cover in plantation areas and farmers' plots	Soil fertility and extent of vegetative cover over time Indicator species Rate of topsoil loss	Field surveys Farmer interviews Soil analysis	Changes to productive and protective functions of forests (soil and water) over time Changes to annual HH consumption derived from forest products Forest cover (natural and secondary growth forests) over time Climatic benefits from sink function of forests Changes to productive and protective functions	Soil fertility and extent of vegetative cover over time Socioeconomic assessment % forest cover Soil fertility and extent of vegetative cover over time Incidence of landslides and flashfloods and consequent damages over time	Interviews of local farmers and community leaders Expert interviews Participatory environmental monitoring Participatory forest inventory Forestry statistics Biological assessment of forest habitats
		Extent of soil erosion from water and wind in plantation areas and farmers' plots					
		Changes to sediment and nutrient inputs into streams and other water bodies from plantations/farmers' plots Changes in flow levels of watercourses	Sediment and nutrient load of watercourses Flow levels of water bodies over time	Direct observation Farmer interviews Water quality analysis Expert interviews			

Table A1.5 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Rate of timber/ nontimber forest product harvesting relative to renewable harvest rate over time	Timber/NTFP production in area over time Indicator species	Interviews of forest authorities Forest statistics Participatory forest inventory	of forests (soil and water) over time Natural or acceptable status of watercourses and their hydrology and bioresources Changes to biodiversity from forest management practices (for example, threatened species) Conversion rate of forest areas into agri-cultural settlements, rangelands	Trends in hydrological and biological statistics Change in certain tree species/area/ time No. of threatened species wildlife Growth of forest area conversion populations	Interviews of local farmers and community leaders Interviews of environmental and water authorities Expert interviews Participatory environmental monitoring
	Area of marginal lands (for example, cleared forestland or degraded rangelands) converted into productive uses	Productive uses of converted marginal lands by community (for example, woodlots) or private sector	Total area revegetated and species cultivated Economic benefits to HHs/ community/ private sector over time	Field surveys Participatory environmental monitoring			
	Areas of environmentally sensitive areas (for example, national parks, wildlife reserves) under protection or conservation frameworks	Maintenance over time of habitat and species diversity in protected areas for example, through forest certification	Habitat status Species numbers No. of threatened species	Ecological assessments	Protected areas as a % of total area Network of protected areas representative over wide areas Maintenance over time of habitat and species diversity in protected areas	Areas under protected areas network Habitat status Species numbers No. of threatened species	Forestry statistics Ecological assessments Records of environmental authorities
		Local community involvement in protection activities, for example, compliance to restrictions on production activities and forest products/ NTFPs harvesting within buffer zones	Local community responsibility defined in management plan	Case studies PRA Community monitoring committees			

Table A1.5 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Support (training, capital, market) for alternative livelihoods provided to poor upland farmers and indigenous forest dwellers	Poor upland farmers and indigenous forest dwellers engaging in alternative livelihoods over time (for example, ecotourism)	Types of/benefits from alternative livelihoods	Sample surveys Case studies PRA	Socioeconomic benefits over time from engagement in alternative livelihoods, community woodlots, forest and agroforest enterprises	Socioeconomic assessment	Sample surveys Case studies
	For other relevant indicators, see also matrix on Agro-enterprise and Forest-Based Enterprise Development.						
Participation in project activities	Training and capacity building provided to men, women, and other disadvantaged groups (no. of persons trained) ***(See above for other relevant output indicators)***	Organized communities/ groups managing woodlots, harvesting of NTFPs, forest enterprises	Commitment of time/resources by members Economic benefits to member HHs	Case studies Farmer interviews and community leaders PRA Records of community meetings	Communities actively involved in management (protection/ conservation, production) of protected areas or reserves based on a management framework/plan Viable farmers' groups and cooperatives over long term Position of women and other disadvantaged groups in local decision-making	Performance of communities against management framework/plan Level and degree of involvement (time allotted; contribution; leadership/ management position) over time Relevance/utility of cooperatives over long term Perceptions of men and women	Case studies Community monitoring committees Institutional analysis Gender analysis
	Capacity building support provided for community-based resource management, forest enterprises	Women or other disadvantaged groups in management committees and boards	Membership; positions of leadership; active participation in meetings	Project MIS Administrative records Records of community meetings			
	Capacity building support provided to local institutions for participatory land-use planning, GIS, community-based resource management	Involvement of forest communities in managing forest areas (that is, protection/ conservation, production) based on a management	Commitment of time/resources by HH members Performance against management framework	Case studies Community monitoring committees PRA			

Table A1.5 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Displacement of upland/ indigenous farmers	Mitigation measures and compensatory mechanisms set out in Resettlement Plans implemented	framework/ plan Restoration/replacement of livelihoods for affected people (including indigenous people and ethnic minorities)	No. of HHs or persons affected Extent of loss and replacement of homesteads and agricultural lands	Census Sample surveys Case studies	Socioeconomic situation of resettled groups or communities re: livelihood, health, and education	In comparison with pre-resettlement	Sample surveys Case studies SIA
Indigenous peoples and ethnic groups	Legal or regulatory framework developed to clarify and establish user and property rights to land and water (marine, inland) resources	Changes to access rights by indigenous and nonindigenous HHs/ communities to common property resources (timber and nontimber) in forests (for example, using forest certification)	Extent of access issues Reports of conflicts with industrial forest producers Certified forest resources use	Case studies PRA Interviews of local authorities and community leaders	Changes to way-of-life and well-being of indigenous peoples and ethnic groups Dissemination of indigenous or traditional practices that promote sustainable resource use	Practice of traditional livelihood sources Results of alternative livelihoods Perceptions of men and women Uptake of indigenous/ traditional practices	Case studies SIA
	Participatory research done of viability and sustainability of traditional upland farming/forest management practices Support provided for alternative livelihood sources	Traditional upland farming/ forest management practices vis à vis sustainable management principles	Implications for sustainable resource management	Case studies PRA			

Table A1.5 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Sharing in opportunities/ benefits from project	Support services provided such as credit, extension, training (no. of farmers—men, women, ethnic or indigenous)	Per capita or HH staple crop production as a % of annual requirements	% of HH annual staple food requirements	Sample surveys PRA	Contribution of forestry to HH income or food production among male- and female-headed households and other disadvantaged groups Nutritional status of children under 5 years Position of women in HH in terms of control over finances/ resources and decision-making	% of annual HH income or food supply Nutritional status (underweight, stunting, or wasting) Perceptions of men/women	Sample surveys Case studies Rapid nutrition surveys Gender analysis
		Proportion of annual HH income (or consumption) derived from upland farming or forest activities	% of annual HH income (or consumption)	Sample surveys PRA			
	Women and other disadvantaged groups who have availed of credit and training	Gender differences in workload as a result of introduced practices or new technology	Shift in roles between men and women in productive and HH activities	Sample surveys Case studies PRA			
	Social support services provided (no. of HHs)	Access to health, education, water and sanitation facilities	Availment and *use* of facilities/ services	Project MIS			
Health impacts on local communities (for example, from plantation development, forest processing enterprises)	Training and information campaigns on OHS in forest products processing plants done	OHS in processing plants in conjunction with local/national standards and regulations	System or procedures in place	Administrative records Review of procedures vis-à-vis local/ national regulations	Incidence over time of OHS problems among plantation and processing plant workers Social issues such as spread of AIDS, prostitution, alcoholism	No. of incidents Extent of social problems	Administrative records Health records Community health surveillance Local authority reports
		Incidence of OHS problems among workers in plantations and processing plants	No. of incidents System or procedures for dealing with OHS issues	Administrative records Review of procedures vis-à-vis local/ national regulations			

Table A1.5 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		No child labor employed in plantations or in commercial processing plants Light labor only for children in family enterprises	Exclusion of persons below 15 years old (13 years old for light work) from wage employment	Direct observation Administrative records			
		Spread of HIV/AIDS, prostitution, alcoholism from in-migrant workers	In comparison with baseline	Health records Local authority reports			

Sources: IISD N.d., FAO 2003, World Bank ESSD Forest Team 2004.

F. High-Value Agriculture

Typical subcomponents in WB-assisted projects:

- Horticulture
- Commercial agriculture
- Fruit tree cultivation
- Support services including research and extension, credit, marketing, information, and communication
- Capacity building for producers' groups.

Commercial agriculture promotes economic and sector growth and rural diversification. It improves the socioeconomic well-being (including reducing poverty) of the target population through value addition and on-farm and off-farm employment. High-value food products usually include fresh and processed fruits and vegetables, fish, live animals and meat, nuts, and spices.

Box A1.6 Environmental and Social Considerations, High-Value Agriculture

Environmental issues

- If not properly considered in land-use planning, clearing areas for cultivation may endanger valuable habitats and biodiversity. On the other hand, in some cases, intensive production requires less land area and reduces the pressure to clear forest.
- In contrast with alternative species, promoting cultivation of less suitable crops that require extensive amounts of water, fertilizers, pesticides, or space; or the processing of which requires a great deal of energy, or pollute the environment if proper methods are not applied, or do not provide nutrition for the malnourished population of the region.
- Accidental release of potentially hazardous agrochemicals from storage or transportation.
- Water and soil pollution, harm to ecosystems, and public health risks due to excessive application of fertilizers, herbicides, and pesticides.
- Improper application of agrochemicals without understanding alternatives (determine nutrient balances and develop optimal fertilizer recommendations, promote crop rotation, introduce more efficient equipment for spreading organic and mineral fertilizers, use IPM, and train staff and farmers).

Socioeconomic issues

- Income generated may alleviate malnutrition if food can be purchased locally, as well as improve education, health, and other social conditions.
- Large-scale development of high-value agriculture can lead to land acquisition that restricts land and use rights of indigenous people, including to common property resources.

Box A1.6 (*continued*)

- Resource tenure issues arise when new assets such as fruit nurseries are developed: care must be taken to ensure that women have control over land and trees and over income derived therefrom (rather than just contributing labor).
- Construction of related infrastructure may result in deleterious effects, for example, dust from roads, impairment of downstream water quality and flow due to irrigation.
- Access by women, minorities, and other disadvantaged groups to employment and other project opportunities.
- Employment of minorities, undocumented workers, and immigrants who are not aware of, or not in a position to demand, safe working environments and equitable salaries.
- Occupational health risks due to dust, materials-handling, noise, or other process operations, and safety of workers in factories/plantations.
- Constraints (cultural, skills, legal rights, bureaucratic processes) faced by women and other disadvantaged groups to own, manage, or work in enterprises.
- If there has not been a source of cash employment in the area previously, there can be a period of adjustment and possible negative social effects (prostitution, alcoholism).
- Migration of women into cities and towns to work in factories, warehouses.
- Effects of women's employment on child- and home-care and subsistence/cash crop production.
- Child labor (below 15 years of age), particularly in very poor areas.
- Risks from animal and plant pests and diseases due to a country's lack of capacities for border control, monitoring, and surveillance.
- Risks of loss of or limited access to export markets due to inadequate capacities to manage SPS hazards.
- Constraints (knowledge, resources, and capacities) faced by smallholders to meet quality and safety standards to participate in high-value agribusiness.
- Attention to regional economic development and spillover effects required so that backward linkages are developed in rural areas and gains from high-value agriculture are not concentrated only in market towns.

Source: Authors.

Table A1.6 Indicators of Social and Environmental Sustainability, High-Value Agriculture

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Please also refer to the following matrices: • ***Agro-enterprise and Forest-Based Enterprise Development matrix for relevant indicators on processing aspects*** • ***Agricultural Policy matrix for policy and trade aspects*** • ***Agricultural Research Extension and Education.***						
Environmental impacts of – *Agricultural intensification*	Environmental considerations in planning and siting plantations, industrial farms Legal and regulatory framework established (for example, environmental monitoring and compliance, environmental standards, trade restrictions such as on product quality and food/health safety standards) Environmentally sound technologies and management practices promoted for quality improvement/value addition of traditional crops (cassava, coffee, forages)	Extent of diversification practiced at farm level, based on crop/livestock/ horticulture systems suited to local agro-ecological conditions	No. of farms/HHs Productivity of mixed farming systems	Field surveys Case studies Farmer interviews and local community leaders	Diversification of farm revenues from adoption of multiple cropping Stability of yields/ productivity over long term Stability of family labor employment and returns over time Regularity of off-farm employment opportunities for women and landless farmers (tenants, sharecroppers) over long term Health risks from high-chemical input to commercially grown food Unknown effects of long-term use of unregulated biotechnology and	Structure and level of farm incomes over time Long-term yields/ productivity No. of weeks per year employed on off-farm activities Metal/trace elements in food Assessing scientific reports on biotechnological concerns	Farm-level cost and returns analysis Farmer interviews and community leaders Health statistics Interviews of experts
		Adoption of recommended practices/technologies by men, women, and other disadvantaged groups such as: • Composting and organic manure • Multiple cropping, intercropping, and rotations • Biological control • IPM • Terracing and other slope stabilization measures	Extent of adoption/ nonadoption among men and women farmers Farm-level cost/benefit analysis of farming practices/ technology	Field surveys Case studies Farmer interviews and local community leaders			

Table A1.6 (*continued*)

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Extent of farm mechanization practiced considering local agro-ecological and labor market conditions	Mechanization of farm activities vis à vis farm labor availability	Field surveys Farmer interviews and local community leaders	genetically modified plant species		
Selection of species for cultivation	Crop diversification models promoted based on labor-intensive rather than capital-intensive crops	Environmental properties of species taken into account in cultivation plans	Consumption of water, fertilizers, pesticides, energy, and space compared with more economic selection of species	Analyzing requirements of cultivated species	Minimization/ reduction in environmental costs of intensive cultivation	Economics of cultivation considering environmental costs	Farm-level cost-benefit analysis Case studies
Application of agrochemicals	Support services (financial services, training, extension, market assistance) provided to smallholder farmers (landowners, tenants, men and women, indigenous and ethnic groups) engaging in high-value farming (crops, livestock, horticultural products) Extension staff trained in environmental aspects of intensive cultivation of high-value farming	Adoption of recommended application rates of agrochemicals, including substitution with green manuring and IPM	Extent of adoption/ nonadoption among men and women farmers Farm-level cost/benefit analysis of farming practices/ technology	Field surveys Case studies Farmer interviews and local community leaders	Pollution of watercourses, groundwater, and soil from cumulative nutrient loading Maintenance of farm-level soil fertility and vegetative, especially on intensively cropped hillsides, over time	Water and soil quality Vegetative cover	Environmental monitoring reports of commercial farms Field surveys Reports of local environmental and local government authorities
		Environmental regulations followed in point-source emission and dispersal pollution control and releases actions taken in case of noncompliance or accidental spills	Compliance to regulations	Local authority reports Interviews of local community leaders			

Table A1.6 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Valuable habitats and biodiversity	Awareness-raising carried out among men and women farmers of environmental impacts of intensive cultivation Special focus accorded to the protection of valuable habitats and biodiversity by community and individual farmers Representative protected sites (of valuable habitats and biodiversity) established	Changes in awareness among men and women farmers of environmental implications of intensive cultivation practices	Knowledge level of local environmental issues Perceptions of men and women	Focus groups PRA	Conversion of forest areas or degraded lands to commercial farming Changes to local valuable habitats and biodiversity (for example, threats to species types and numbers, habitats)	Forest/degraded areas converted No. of affected species areas of valuable habitats	Farmer interviews, community leaders, and local authorities Field surveys
Institutional support	***Refer also to Agricultural Policy matrix.***						
	System of border control, monitoring, and surveillance established to protect against foreign animal and plant pests and diseases Border authorities trained in crop and livestock protection	Border control, monitoring, and surveillance implemented to protect against foreign animal and plant pests and diseases	No. and staffing of border control points Compliance to regulations	Institutional analysis Administrative records	Protection of indigenous crops and livestock species against foreign animal and plant pests and diseases	Incidence of pest or disease outbreaks traced to introduction of foreign species	Administrative records Field research

Table A1.6 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Participation in project activities and sharing in opportunities/ benefits from project	***(See also above indicators)*** Support services and capacity building for organized groups of smallholder farmers (inclusive of landowners, tenants, men and women, indigenous and ethnic groups) to manage technical, regulatory, financial, marketing and management requirements of high-value farming Legal and management advice provided to small farmers to pursue beneficial contractual relationships with commercial buyers or industrial users Incentives for poor small farmers and large growers to engage in contract farming	Organized producers' groups inclusive of poor, small farmers (men and women landowners, tenants, sharecroppers, ethnic and indigenous groups)	Management structure and membership Satisfaction with terms and conditions of contract Services provided to members	Farmer interviews and producers' groups	Capability of organized producers' groups to negotiate beneficial contracts with commercial buyers, coordinate contracted production, and provide or organize services required by members Poor, small farmers (men and women) participating in agricultural supply chains Annual HH incomes and employment among poor HHs, female-headed households, and other disadvantaged groups Nutritional status of children under 5 years Position of women in households re: control over finances/resources and decision-making	Capacity and performance of producers' groups % of export volumes supplied by small farmers Annual HH incomes On- and off-farm employment of family members Underweight, stunting, or wasting among children under 5 Perceptions of men and women Time allocation for HH and production activities Structure/supply sources of local food commodities	Farmer interviews and producers' groups Institutional analysis Sample surveys Rapid nutrition surveys Case studies Gender analysis Market studies
		Producers' groups representing collective interest in dealings with commercial buyers or industrial users					
		Producers' groups providing business and support services to their members					
		Farmers and their households under beneficial contract farming arrangements with commercial or industrial producers experience improvement in incomes and family labor employment	No. of farmers Farm-level outcomes of contract farming	Project MIS Sample surveys Case studies			
		Gender differences in workload	Shift in roles between men and women in productive and HH activities	Time-use studies			

Table A1.6 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		New employment generated in commercial farms or plantations for poor women and other disadvantaged groups	Number or % of jobs to total new employment	Administrative records of firms	Changes to time available for child-care, house upkeep, and subsistence/cash crop production Changes in structure/ supply sources of local food markets as contracted production takes precedence over local food production		
		Changes to HH food production or food supply arrangements as a result of focus on contracted production	HH-level adjustments	Sample surveys Case studies PRA			
Labor standards in plantations/ commercial farms	Information campaigns carried out for commercial farmers, farm laborers, and community on acceptable labor standards Commercial farmers trained and assisted on OHS issues; enterprise-level information campaigns carried out on acceptable labor standards Entrepreneurs or business operators trained and assisted in OHS issues, corporate social responsibility	No child labor employed in factories/ plantations Light labor only for children in family enterprises	Exclusion of persons below 15 years (13 years for light work) from wage employment in factories/ plantations	Participant observation Administrative records	Wage and conditions equality for men and women and at-risk groups for comparable capabilities and skills Health risks to farm workers and nearby communities from intensive application of agrochemicals	Wage levels and conditions of employment Complaints from workers/ communities Incidence of related health problems	Administrative records Case studies Community health surveillance
		Differences in wages or working conditions, if any, between women and other disadvantaged groups, and men	Wage levels by gender (assuming comparable capabilities and skills)	Project MIS or administrative records Case studies			
		OHS of all workers in commercial farms/ plantations in conjunction with local standards and regulations	System or procedures in place	Administrative records			

Table A1.6 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Incidence of OHS issues and whether they were effectively handled and measures taken to prevent future incidents	No. of incidents	Administrative records Case studies			
		Corporate programs implemented by large commercial farms to improve women's well-being (health and child-care facilities, literacy classes)	Budgets allocated No. of women benefited	Administrative records			

Sources: Dolan and Sorby 2003, CIAT 2005, World Bank 2005b.

G. Land Policy and Administration

Typical subcomponents in WB-assisted projects:

- Land/agrarian reform
- Land administration (institutional strengthening, dispute resolution system, land valuation and taxation systems)
- Land titling (cadastral surveys, land registration system)
- Land privatization.

Land policy and administration typically will aim at rationalizing the way that land rights are held, transacted, and managed in a particular country. Land is the most important asset for agriculture-dependent households and the lack of it has been the primary reason for high rates of poverty in rural areas. Land ownership is an entry point for accessing credit and other support services, and is a strong incentive for additional investments on land (for example, permanent improvements, soil conservation).

Box A1.7 Environmental and Social Considerations, Land Policy and Administration (Refer to Other Matrices for Subsector-Specific Land-Use Issues.)

Environmental issues

- Poor land-use planning leading to overexploitation of resources and ignored environmental protection
- Poor availability of quality maps leading to inadequate consideration of land types when dividing land

Socioeconomic issues

- Conflicts between formal law, customary law, and family or personal law on legal rights of women to own and use land, including rights of inheritance and effects of marriage
- Sociocultural and legal impediments to asset ownership by women and other disadvantaged groups
- Conflicts among different user groups, usually displacing the powerless groups such as ethnic minorities, the very poor
- Insufficient land size due to large family sizes and resulting land division
- Impacts of differentiated land rights between men and women on women's access to land, credit, and other support services, and women's share in the economic benefits from the productive use of land
- Traditional land rights (usually of ethnic minorities) often ignored in land use or resource management plans

Table A1.7 Indicators of Social and Environmental Sustainability, Land Policy and Administration

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Environmental issues of various forms of land use	***Refer to other matrices dealing with land-based subsectors for specific indicators relating to various forms of land* use:** • ***Forestry*** • ***Smallholder Agriculture*** • ***Fisheries Development*** • ***Livestock Development and Rangeland Management*** • ***Agro-enterprise and Forest-Based Enterprise Development*** • ***Agricultural Policy***						
Women's legal rights to own and use land Access and user rights of indigenous peoples and ethnic groups	Legal and regulatory framework established recognizing formal and customary rights of men and women to land/property ownership Consistency in the recognition of women's land rights in formal land law, customary law, and family or personal law Recognition of traditional access and user rights of indigenous peoples and ethnic groups to land, forest and water	Changes in men's and women's formal and customary legal status	Assignment of rights in formal and customary laws	Review of legal framework and customary laws	Changes in the distribution of land rights (individual joint) between women and men Economic benefits to women land-owners and their households from owning land/property Position of women in household decision-making (for example, control over resources and finances) and social standing Changes to the way of life and well-being of indigenous peoples and ethnic groups	Access to credit and support services Earnings from productive use of land/property Practice of traditional livelihood sources Perceptions of men and women	Land registry statistics Sample surveys Case studies SIA Gender analysis Most significant change evaluation
		No. of individual titles issued to men and women, and joint titles	Numbers	Land registry statistics			
		Traditional communal resources relied on by indigenous and ethnic groups for livelihood formally recognized on local land-use maps and plans	Land-use maps and plans	Review of land use maps and plans Interviews of local planning staff			
		Stewardship titles and other forms of communal contracts issued to indigenous and nonindigenous communities for community-based management of forestlands, buffer zones	Access and user rights to communal resources Performance against agreed management framework	Field surveys Farmer interviews and local leaders			

Table A1.7 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Support provided for land mapping and titling, and for dispute resolution processes Gender sensitization of land administration services	Changes to access and user rights of indigenous and ethnic groups to traditional communal resources	Limitations to access and use of communal resources	Field surveys Farmer interviews and local leaders			
Too much pressure on land to support existing population	Vocational training and business development services provided Alternative income generation possibilities developed	Poor, small farming households employed in alternative (off-farm, nonfarm) employment	Numbers of people living per ha of farm land Diversity of income sources Income/family	Sample surveys	Changes to the way of life and well-being of smallholder farmers	Diversity of income sources Perceptions of women and men	Sample surveys SIA
Unequal distribution of land in agrarian societies	Legal and administrative framework in place for effective land transfer or land redistribution, including compensatory mechanisms and dispute resolution processes Support services (rural infrastructure, extension, financial services, enterprise development, health and education,	No. of landless men and women farmers (tenants, sharecroppers) who have been issued titles to (or are amortizing) agricultural lands	Numbers In comparison with total number of landless farmers	Project MIS Administrative records	Economic benefits to men and women land-owners and their households from owning land/property Social standing of men and women farmers from obtaining land ownership Investments in physical capital and land improvements (for example, soil conservation) over long term and	Access to credit and support services Earnings from productive use of land/property Perceptions of men and women Organized action(s) and commitment of time/resources	Sample surveys Case studies SIA
		Infrastructure constructed or rehabilitated according to the needs and desires of community Women's particular needs considered in infrastructure design and siting	Infrastructure in full use as anticipated by project plans Treatment of specific issues raised in the design	Project MIS Post-construction assessment			

Table A1.7 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	community development) provided to new land-owners in agrarian reform communities	Access to support services and facilities by men and women farmers	Membership in users' groups	Administrative records Sample surveys Community monitoring committees	subsequent improvement in productivity Functional farmers' groups or associations, including smallholder men and women farmers (landowners, tenants) as members, taking responsibility over adequate O&M of completed facilities (repayment of service fees over time, replacement costs)		
		Time spent or distance walked by HH members to collect potable water	By gender and age	Sample surveys Direct observation			
		Access to public/private sanitation	Presence and availability of facilities	PRA Sample surveys PRA			
		Community involvement in planning/ implementation of project activities	Commitment of time/ resources	Community monitoring committees			

Sources: Deininger and others 2000, World Bank 2005d.

H. Livestock Development and Rangeland Management

Typical subcomponents in WB-assisted projects:

- Livestock development (small- and medium-scale livestock operations on free-grazing or stall-feeding basis subsistence mixed farming)
- Management of environmental and health externalities of large-scale livestock production
- Rangeland management
- Traditional pastoral systems
- Livestock markets and milk collection centers, auction centers, abattoirs, and milk processing plants
- Veterinary and other technical services
- Training and education
- Game ranching

Most projects aim for (a) improvement of rangeland conditions and productivity, health and productivity of livestock (small and large animals) for meat, milk, hides, and fiber, or for traction and organic fertilizers and the well-being of households involved in livestock production or (b) mitigation of environmental, health, and social externalities.

Box A1.8 Environmental and Social Considerations, Livestock Development and Rangeland Management

Environmental issues

In dry areas:

- Erosion and land degradation due to overgrazing, excessive water development, restriction of mobility, and inadequate marketing infrastructure
- Impediments to movements of migrating wildlife caused by long fences
- Encroachment of dryland agriculture and irrigation into critical dry grazing areas (valley bottoms) of rangelands
- Introduction of farmed animals in contrast with more ecologically suitable local nondomestic livestock
- Lack of adequate drought response systems

In more humid areas:

- Clearing intact forest areas for cattle ranching and feed grain (soy bean) production
- Deforestation as a result of destruction of saplings in natural pastures, and gully formation on hill sides
- Accidental burning can of savannah vegetations leading to increased soil erosion

Box A1.8 (*continued*)

Intensive production:

- Shift to intensive production techniques, such as animal feedlots and pig and poultry production, without adequate provisions for waste management
- Contamination of land and water with manure and eutrophication of water bodies due to poor manure handling and storage systems, and lack of transportation means
- Lack of environmental standards and appropriate incentives applicable to the sector, especially to intensive operations such as feedlots and processing plants, to mitigate soil, water, and air pollution
- Poor management of veterinary chemicals, such as antibiotics, leading to antibiotic resistance in bacteria, with detrimental effects on humans and animals

Socioeconomic issues

- Lack of understanding of concept of the need for flexible stocking in dry areas
- Erosion of indigenous tenure systems and organization, and changes in people's traditional access to resources (for example, for forage and fodder), and changes over time of traditional local rules for regulating access to common property resources
- Increased sedentarization and settlement often forced by state programs
- Labor availability and involvement in wage-labor markets
- Highly skewed livestock ownership in most rangelands (few owners of large numbers of livestock, and the majority owning fewer or no livestock)
- Skewed intrahousehold property rights based on gender and age
- Smallholders being crowded out by large enterprises, without alternative employment
- Risk of zoonoses (animal diseases that can be transmitted to humans)

Table A1.8 Indicators of Social and Environmental Sustainability, Livestock Development and Rangeland Management

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Environmental and resource management issues: *Extensive ranching (individually owned) systems*	Environmental considerations in land-use planning (for example, zoning, protected areas) Training and awareness-raising carried out among men and women farmers on the links between pasture management and animal health, livestock stocking levels, environmentally benign methods of production, and disease control Extension staff trained in environmental aspects of livestock production Support services (training, financial services, extension) provided to men and women farmers	Awareness among ranchers of relationship between livestock numbers on the health of pastures	Level of awareness Pasture carrying capacity	Farmer interviews Pasture carrying capacity analyses	Animal production per head or per ha over time Off-take rates of livestock over time Extent of land degradation (around water points, gully formation) Water quality and quantity changes as a result of livestock access (surface and bore water) Regeneration rate of pastures over time Changes to biodiversity (for example, threats to species types and numbers, habitats) Maintenance of valuable habitats (protected areas)	Livestock numbers and outputs Carrying capacity of pastures Extent of vegetative cover or exposed soil over time No. of vegetative species per ha Forest areas converted Water quality testing No. of affected species areas of valuable habitats Areas of protected habitats, ha.	Interviews of local farmers and community leaders Study on the carrying capacity and ecology of rangelands Field surveys Mapping erosion and land degradation Ecological surveys Participatory environmental monitoring
		Vegetation (or rest) period of rangelands practiced/observed by ranchers	Evolution of botanical composition of rangelands	Farmer interviews and community leaders			
		Animal production (meat, milk) per head or per ha over area and time under traditional livestock production	Production efficiency Carrying capacity of rangelands	Farmer interviews			
		Farmers undertaking combined livestock production and wildlife ranching	No. of farmers Size of herds and areas	Field surveys Farmer interviews			

Table A1.8 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Traditional pastoral systems (communally owned)	Valuable habitats in rangelands/ communal pasture areas declared under protection/ conservation Land-use mapping and planning services delivered	Area of rangelands maintained under traditional management practices	Ha	Field surveys Farmer interviews and community leaders	Animal production per head or per ha over time Off-take rates of livestock over time Extent of land degradation (around water points, gully formation) Water quality and quantity changes as a result of livestock access (surface and bore water) Regeneration rate of rangelands over time Changes to biodiversity (for example, threats to species types and numbers, habitats) Maintenance of valuable habitats (protected areas) Ecological effects of livestock species on grazing lands Effects of livestock on wildlife	Livestock numbers and outputs Carrying capacity of pastures Extent of vegetative cover or exposed soil over time No. of vegetative species per ha Forest areas converted Water quality testing No. of affected species areas of valuable habitats Areas of protected habitats (ha.) Ecological and environmental assessment	Interviews of local farmers and community leaders Study on the carrying capacity and ecology of rangelands Field surveys Mapping of erosion and land degradation Ecological surveys Participatory environmental monitoring Ecological and environmental studies of rangelands
		Critical dry season areas protected	Areas affected (ha.)	Field surveys Farmer interviews and community leaders			
	Early warning and response system in place	District and community level drought plans prepared	Availability of plans Response time for drought relief	Field surveys			
	Extent of land degradation in and around water points observable during project timeframe	Vegetative cover over space and time	Extent of land degradation in and around water points over time Water quality and quantity changes as a result of livestock access (surface and bore water)	Direct observation Farmer interviews			
	Legal and regulatory support provided to protect traditional access rights of herders/ pastoralists to rangelands	Traditional access to pasture areas affected by encroachment (settlements, agriculture, rural	Availability of legislation that ensures adequate mobility	Review of land laws Case studies Participatory and formal			

Table A1.8 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Procedures for dispute resolution between traditional pastoralists and new neighbors facilitated	infrastructure) or physical barriers (fences) over time Access to water resources	Areas affected Extent of loss of access	mapping exercises PRA Farmer interviews and local community leaders			
	Financial institutions established offering financial services to traditional herders/ pastoralists Marketing support provided to encourage greater animal off-take	Off-take rates of livestock over time	Size of herds per farmer Age of livestock at sale	Sample surveys Farmer interviews			
		Traditional herders/ pastoralists participating in savings schemes	Number saving rates Repayment rates	Administrative records of financial institutions Farmer interviews			
	Research carried out on appropriate stocking levels for local conditions Agriculture extension officers provide quality extension service	Optimal selection of animals considering ecology of area	Suitability of livestock species to grazing land and ecology	Ecological studies on effects of grazing			
	Participatory research conducted on traditional practices of land and resource management	Traditional practices compatible with sustainable resource management	Contribution to sustainable resource management	Case studies PRA Participatory M&E			

Table A1.8 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Humid tropical pasture land	Legislation and its enforcement to protect humid forest areas in plans	Legislation and incentives implemented to reduce or stop deforestation	Availability of institutions with staff to monitor and control land-use changes	Field surveys Institutional analysis	Conversion of forest areas into grazing lands Productivity and species mix of pasture lands over time Animal production per head or per ha over time	Forest areas converted Yields of forage species Production efficiency	Field surveys Interviews of local farmers and community leaders
	Current area under pasture maintained or reduced	Intensification of currently used pasture land with more productive species mixtures	Area deforested/ forested	Satellite and GPS technology			
Intensive grazing systems	Training and awareness-raising carried out among men and women farmers on good environmental management in intensive livestock production including manure collection and storage, technologies for better feed conversion Support services (financial services, training, extension) provided to men and women farmers to implement recommended technologies and management practices	Adoption of recommended practices/technologies among male and women farmers	Extent of adoption/ nonadoption	Farmer interviews Sample surveys Case studies	Animal production per head or per ha over time Area equivalent of feed requirements per head Conversion of forest/ agricultural areas for feed production Pollution of watercourses and soil from cumulative nutrient loading Changes to biodiversity (for example, threats to species types and numbers, habitats)	Livestock numbers and outputs Ha grown for feed Forest/ agricultural areas converted Soil and water quality No. of affected species areas of valuable habitats	Interviews of local farmers and community leaders Field surveys Ecological surveys Soil and water quality analysis
		Areas devoted for growing feed Feed crops cultivated optimal considering local ecology Animal production per head or per ha over time Feed conversion rates (for meat and milk)	Ha Types of feed crops grown Production efficiency	Field surveys Farmer interviews Farm records			
		Species shift toward monogastric animals	No. of farms Livestock numbers	Field surveys			
		Shift toward introduced species over indigenous breeds	Livestock breeds Indigenous breeds under threat	Field surveys			

Table A1.8 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Farmers practicing improved manure collection and storage techniques	Extent of adoption/ nonadoption	Farmer interviews Sample surveys Case studies			
		Reuse of manure and other wastes in other farm enterprises	% of nutrient requirements met by organic manure	Farmer interviews			
		Water and soil pollution as result of nutrient loading from organic and inorganic fertilizers	Soil and water quality	Soil and water quality analysis Interviews of local authorities			
	Training provided to female and male farmers and animal health workers Enforcement of withdrawal times for drug use in animals for human consumption	Female and male farmers practicing proper use and management of veterinary chemicals	Use rates at farm-level	Farm records Farmer interviews	Incidence of human or animal health problems caused by veterinary chemicals	Health effects of veterinary drugs on humans and animals	Community health surveillance Local health statistics
Mixed farming systems	Support services (training, financial services, extension) promoting favorable practices to farmers: • Use of waste products (crop residues, manure) as inputs for other enterprises	Adoption of recommended practices/technologies among male and women farmers	Extent of adoption/ nonadoption	Farmer interviews Sample surveys Case studies	Animal/crop production per farmer/HH and per ha over time Maintenance of soil fertility from use of manure and biomass over time	Livestock numbers/ livestock and crop outputs Soil analysis vegetative cover over time crop yields	Interviews of local farmers and community leaders Field surveys Ecological surveys
		Changes to farm incomes (structure, levels) from on-farm activities (livestock, crops)	Farm-level analysis of costs and returns	Farm-level cost-benefit analysis Farmer			

Table A1.8 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	(as feed or fertilizer • Rotations between various crops and forage legumes • Agroforestry such as rows of fodder trees and grass bands	Savings in input/fuel costs from using animal draught and manure and other farm wastes	% of nutrient/ input requirements met by animal draught/ organic manure	interviews	Contribution to maintenance of biodiversity (species types and numbers habitats) Maintenance of groundwater reserves	No. of affected species areas of valuable habitats	
		Changes to soil fertility from use manure and biomass over time	Soil fertility over time Yields/outputs	Soil analysis Farmer interviews			
		Extent of soil erosion from wind and water	Soil fertility and vegetative cover over time	Soil analysis Farmer interviews Direct observation			
	Training to female and male farmers and animal health workers provided Enforcement of withdrawal times for drug use in animals for human consumption	Female and male farmers understanding and practicing proper use and management of veterinary chemicals	Use rates at farm-level Residues in meat or milk at processing	Farm records Records of dairy processing facilities or abattoirs Food inspection reports Farmer interviews	Incidence of human or animal health problems caused by veterinary chemicals, or via increased antibiotic resistance Risk of transmission of animal diseases to humans (for example, avian influenza, brucellosis, leptospirosis)	Health effects of veterinary drugs on humans and animals Incidence of antimicrobial resistance Incidence or morbidity or mortality	Community health surveillance Local health statistics Reports of disease outbreaks
Landless (or industrial production) systems	Environmental considerations in planning and siting of industrial farms, farm management plans	Industrial farms (pigs, poultry, cattle) relying on local feed supply based on locally suitable crops and livestock density in line with absorptive	Nutrient balances of region	Farmer interviews	Animal production per head or per farm over time Area equivalent of feed requirements per head	Livestock numbers/ outputs Ha grown for feed	Farmer interviews and local community leaders

Table A1.8 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Legal and regulatory framework established (for example, environmental monitoring and compliance, environmental standards) Technologies or management practices recommended for reducing environmental damage (primarily wastewater) and use of manure Support services (financial services, training, extension) provided	capacity of surrounding areas			Risks to wetlands and aquatic systems and biodiversity of high concentrations of effluents from industrial systems Potential for saving biodiversity and land in more fragile ecosystems High concentrations of greenhouse gas emissions over time contribute to global warming	Areas of valuable habitats, nos. of affected species	Ecological surveys Expert interviews (environmental authorities) Livestock population (species and numbers)
		Adoption of recommended practices/technologies in industrial farms, particularly for manure collection and storage	Extent of adoption/ nonadoption	Site visits Farm records Case studies			
		Animal production per head or per farm over time Feed conversion rates (meat and milk)	Production efficiency	Farm records Farmer interviews			
		Species shift toward monogastric animals	No. of farms Livestock numbers	Field surveys			
		Shift toward introduced species over indigenous breeds	Livestock breeds Indigenous breeds under threat	Field surveys			
		Water and soil pollution as a result of nutrient loading from organic manure	BOD, nitrogen, phosphate, and suspended solids	Soil and water quality analysis Interviews of neighboring farmers and local authorities			
		High concentrations of greenhouse gas emissions	CO_2, methane, nitrous oxide	Livestock population (species and numbers)			

Table A1.8 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Environmental standards for enforcement of withdrawal times for drug use in animals for human consumption	Industrial farms understanding and practicing proper use and management of veterinary chemicals	Use rates at farm-level Residues encountered in meat or milk at processing	Farm records Records of dairy processing facilities or abattoirs Food Inspection reports Farmer interviews	Incidence of human or animal health problems caused by veterinary chemicals, or via increased antibiotic resistance Risk of transmission of animal diseases to humans (for example, avian influenza, brucellosis, leptospirosis)	Health effects of veterinary drugs on humans and animals Incidence of antimicrobial resistance Incidence or morbidity or mortality	Community health surveillance Local health statistics Reports of disease outbreaks
	For other relevant indicators, see also matrix on Agro-enterprise and Forest-Based Enterprise Development.						
Participation in project activities	Support for capacity building of livestock owners, processing or marketing cooperatives, women's groups Community discussions held on problems and appropriate solutions Improved coordination among organizations involved, for example, environment, agriculture, local government, and community	Community-based structures for rangeland management based on traditional social organizations	Management structure services provided to members	Interviews of local farmers and community leaders	Local community taking responsibility for providing services (animal health, extension) and proper rangeland management	Level of involvement and awareness among farmers Adoption of internal regulations for communal pasture use	Interviews of local farmers and community leaders Case studies Institutional analysis
		Local regulations for communal pasture access agreed on and enforced by community	Regulations adopted and effective	Interviews of local farmers and community leaders			
		Established and well-functioning producers' groups or marketing cooperatives	Management structure services provided to members; membership inclusive of women and other disadvantaged groups	Project MIS Administrative records Case studies			

Table A1.8 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Women in management committees and boards of producers' groups and cooperatives	% of total membership Positions of leadership	Project MIS Administrative records			
Sharing in opportunities and benefits from project	Farmers/graziers provided with support and credit services Extension workers giving particular support to disadvantaged groups such as smallholder farmers and traditional herders/pastoralists Financial and support services provided to women and other disadvantaged groups	Women and other disadvantaged groups (for example, landless farmers, small-scale farmers, indigenous and ethnic groups) have availed of credit and training from project, and are engaged in livestock production	Number or % total beneficiaries No. of animals per HH and motivation for livestock production (meat, milk, draught)	Sample surveys Case studies Project MIS or administrative records	Contribution of livestock/mixed farming production to HH income, or food production among female-headed HHs and other disadvantaged groups Meat and milk in HH diets supplied from own production Nutritional status of children under 5 years Distribution of livestock ownership among poor and well-off HHs Position of women in households in terms of control over assets (livestock), access to profits, and decision-making	% of annual HH income or food production No. of times per week or % of weekly requirements Underweight, stunting, or wasting Average size of herds owned by farmers/HHs by income group Perceptions of men and women	Sample surveys Rapid nutrition surveys Case studies SIA Gender analysis
		Gender differences in workload for livestock production and HH activities	Shift in roles between men and women in productive and HH activities	Sample surveys Case studies PRA Gender analysis			
		Women among livestock producers, especially of cattle	% of total	Sample surveys Case studies Gender analysis			
	Legal and regulatory support provided to protect traditional access rights of herders/ pastoralists to rangelands, including procedures for conflict or dispute resolution	Continued access to traditional fodder and forage and water resources by disadvantaged groups (such as small-scale farmers, landless farmers, women farmers)	In comparison with medium- and large-scale farmers	Sample surveys Case studies			

Table A1.8 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Communities encouraged to set aside forage and fodder for disadvantaged groups						
	Support (training, capital, market) for alternative livelihoods provided to poor HHs involved in traditional livestock production	Poor farming HHs and traditional herders engaging in alternative livelihoods over time	Types of and benefits from alternative livelihoods	Sample surveys Case studies PRA PM&E	Socioeconomic benefits over time from engagement in alternative livelihoods	Socioeconomic assessment	Sample surveys Case studies

Sources De Haan 2006, Steinfeld and others 1997, World Bank 1996a.

I. Rural Finance

Typical subcomponents in WB-assisted projects:

- Financial services for farm households or off-farm businesses (micro, small, medium, and large enterprises)
- Savings
- Insurance, including crop or livestock insurance
- Transfer payments
- Leasing
- Affordable rural microinsurance
- Development of financial services bureaus and rating agencies through workshops and training
- Bank credit intermediation services
- Rural market development
- Product development and services bundling, including securitization of rural financial products through innovative regulatory framework
- Risk management unique to rural finance
- Rural employment and income generation to sustain rural finance
- Basic managerial finance and management system
- Knowledge-sharing workshops and training (entrepreneurial and business leadership, microentrepreneurial management)
- Rural finance
- Basic rural finance technology infrastructures

A rural finance component typically improves productivity in agriculture, forestry, and fisheries by providing financial services and short-term loans for social needs (such as paying school fees or health care bills), generating off-farm employment, and creating capital (savings).

Box A1.9 Environmental and Social Considerations, Rural Finance

Environmental Issues

Support may lead to unwanted results of development concerning rational resources use.

Socioeconomic issues

- Poor education and lack of skills in handling finances, especially among indigenous peoples and ethnic groups.
- Earlier experience with donor-funded rural finance may lead beneficiaries to consider the loan as a grant.

- Often repayment is low if donor agencies are seen to be involved.
- Subsidized loans do not reflect true costs and are not sustainable long term; they also may undermine local banking systems.
- The importance of basic technology infrastructure in rural finance outreach and market efficiency may be overlooked.
- Private capital is formed through basic ventures instead of pure savings.
- Formal banking staff prefer to provide loans to fewer, larger, low-risk clients than to many poor clients.
- Lack of capital may not be the problem. The problem often is lack of knowledge of local systems, lack of access in remote areas, and poor understanding (particularly for those of limited education) of how to fill in complicated bank paperwork.
- Often there is only limited experience with insurance systems in developing countries; unfamiliarity leads to reluctance to take out insurance.
- Lack of secure, well-funded companies to provide insurance cover, particularly for long-term, high-value insurance such as for livestock or infrastructure and equipment.
- Inadequate business extension services may result in difficulty in generating sufficient additional income to repay the loan.

Source: Authors.

Table A1.9 Indicators of Social and Environmental Sustainability, Rural Finance

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (output indicators)	Measurement/ assessment	Tools/methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Local/*in situ* environmental issues	Entrepreneurs/ business operators with environmental awareness training Business and operating plans with environmental considerations	Project-supported enterprises and businesses demon-strating environmental responsibility (specific in situ environmental impacts identified and managed)	% of enterprises/ businesses with environmental management plans and addressing environmental issues	Review of business plans Site visits of factories/ business premises Interviews	Environmentally sound operations of enterprises and businesses (for example, in situ environmental impacts reduced or adequately managed; wastes minimized or recycled; efficient technology)	Enterprise-level environmental performance	Environmental audit of enterprises Local authority compliance rep orts
Participation in project activities and opportunities/ benefits	Persons/HHs availing of financial services Lending criteria identify primary target groups or areas of concern	Gender or ethnic differences in access to financial services	No. of men, women, indigenous people and ethnic groups who availed of financial services	Project MIS	On-farm or enterprise earnings of female-headed HHs and other disadvantaged groups as a result of access to financial services and training support Surplus earnings reinvested back into business or reserved to cover replacement costs of infrastructure or equipment Productive assets held by women Position of women in HHs in terms of control over finances/resources and decision-making	% of annual HH income Expansion of enterprise operations Ownership of productive assets by women Perceptions of men and women	Sample surveys Case studies Gender analysis
	Persons/HHs trained or supported by financial services Men and women running their own enterprises	Poor HHs, women, and other disadvantaged groups running viable agro, forest, or fisheries-based enterprises	No. or % of total beneficiaries Enterprise viability	Project MIS Sample surveys Case studies			
	New enterprises set up with project support (training financial services) and staff numbers	New employment generated by project-supported activities including for women and other disadvantaged groups	No. (or value) of new jobs created for men, women, and members of disadvantaged groups	Project MIS Sample surveys			
	Women engaged in diversified farming,	Changes in productive hours	In comparison with baseline or	Sample surveys Case studies			

Table A1.9 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	processing, or post-harvest activities	spent by, or earnings of, women from HH-level farming, processing, or post-harvest activities	as % of annual HH income or food production				
Indigenous peoples and ethnic groups	Persons/HHs from indigenous and ethnic groups availing of financial services and training	On-farm or enterprise earnings of persons/ HHs as a result of financial services and training support	On-farm or enterprise earnings	Sample surveys Case studies	Socioeconomic situation in terms of income, food security Productive assets held by indigenous peoples and ethnic groups	Annual HH income or food production Ownership of productive assets	Sample surveys Case studies
		Effective application of financial services to production activities	Evidence of financial services application to production activities	Sample surveys Case studies PRA			
Institutional capacity	Repayment rates across financial products by season, gender, and social group	Overall repayment rates by women, indigenous peoples, and ethnic groups	% repayments	Administrative records	Financial institution is self-sustaining over time through: • Increased retained earnings to investment • Creating sufficient internal cash flows to finance operations and future growth	Overall repayment rate Coverage and rounds of lending Value addition through business growth and profitability Positive net cash flows and operating profits	Administrative records of financial institution Institutional analysis (budget and accounting controls. management structure systems and procedures)
	Men and women availing of leadership and management training by gender or social group	Women and other disadvantaged groups sitting in management boards/committees	Membership positions of leadership held	Project MIS Administrative records			
	Officials/staff trained in leadership and management,	Ability to lower cost of capital through operating efficiency	Well-defined business and operating plans	Review of plans and operating results			

Table A1.9 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	systems and procedures Financial institutions assisted in systems development and operation (for example, budget and accounts control, customer relations)	Sustained operations and viability of project-supported enterprises and businesses	Well-defined social and financial return objectives/business plans Availability of business or farming services development support	Review of plans and operating results			

Sources: De Hann 2006, steinfeld and others 1997, World Bank 1996a.

J. Rural Infrastructure

Typical subcomponents in WB-assisted projects:

- Irrigation (dams, canals) and drainage
- Rural roads, paths, and bridges
- Dams and reservoirs
- Terracing
- Water supply and sanitation
- Rural electrification
- Markets, auction centers, and abattoirs
- Small-scale rural kindergartens, schools, health clinics, maternity houses, and meeting places.

The main aim of rural infrastructure development is to improve agricultural productivity and access to promote overall economic growth and improve the socioeconomic well-being (including reducing poverty) of the target population.

Box A1.10 Environmental and Social Considerations, Rural Infrastructure

Environmental Issues

- Loss of precious ecological values, natural habitats, and biodiversity due to damming, irrigation, and water abstraction.
- Disruption of hydrology and ecology of natural waterways.
- Decline of original fish stocks due to changes in river flow, deterioration of water quality, water temperature changes, loss of spawning grounds, and barriers to fish migration.
- Impairment of downstream water quality (salinity, nutrients, agrochemicals, suspended sediments), deteriorating beneficial uses of water there.
- Pollution and eutrophication of water bodies of the area due to discharges from fields (nitrogen, N and phosphorous, P loads as indicators).
- Pollution of neighboring area and downstream due to solid, water, and odor discharges from market areas and abattoirs.
- Nutrients reaching the sea due to destruction of wetlands and other buffer systems.
- Regional flooding, water logging, and salinity intrusion as a consequence of excessive use of water or discharging drainage to lowlands.
- Embankment erosion and siltation due to hydrological regime changes.
- Over-pumping groundwater, leading to salinization and ground subsidence.
- Leaching soil nutrients and changes in soil characteristics due to excessive irrigation.
- Introduction, or increase in incidence, of water-borne or water-related diseases (pathogens, vectors).

Box A1.10 (*continued*)

- Impediments to movements of people and animals caused by long canals.
- Seawater intrusion into downstream freshwater systems due to reduced discharges in rivers.
- Road construction reducing green cover and forestry, requiring leveling and changing the overall landscape.
- Well-designed drainage prevents flooding and the resulting intrusion of saltwater that increases soil salinity. Poorly designed drainage may exacerbate salinity and water logging.
- Terracing protects the soil through better soil and water movements, thus minimizing erosion.

Socioeconomic issues

- Development of irrigation systems should be based on meeting the water requirements of smallholders and both cash and subsistence crops.
- Dislocation or involuntary resettlement of people leading to socioeconomic disruption (such as loss of homestead and agricultural land, and livelihood) and decrease in the standard of living of resettled people (particularly indigenous peoples).
- Loss of historic or cultural features of the land, for example, ancestral lands of indigenous peoples.
- In-migration of people into the area during construction and after completion (for example, in-migrant workers, as a result of access roads).
- Health risks posed by in-migrant construction workers (for example, HIV/AIDS).
- Constraints (for example, cultural, legal) to gaining access to services and facilities provided by the project experienced by women and members of indigenous peoples and ethnic groups.
- Loss of resource access/title through changes in land tenure and use rights.
- Inequitable access/distribution of new asset development.
- Forced provision of free or low-salaried labor, money, or land as part of local community contribution, often without sufficient consultation.
- Single-sector water users' associations often focus only on male landed farmers and deal only with crop irrigation uses, instead of encompassing all users (male tenants, women, and others) and dealing with broader water allocation issues (for agricultural, domestic, and industrial purposes).
- Lack of consultation and input from women or other disadvantaged groups (particularly ethnic groups with different languages) in infrastructure prioritization, design, and siting.
- Increased road accidents and dust from road traffic.
- Provision of roads, rural infrastructure, and easy access to population centers may lead to both improved standard of living (access to jobs, schools, health care, social interaction) and social risks (prostitution, alcoholism).
- High potential for corruption in infrastructure construction contracts.
- Inadequate community involvement in contracting and implementation can lead to poor quality or inappropriate design and construction.
- Under-emphasis in design and planning of multiple-use infrastructure including "production-plus" and "domestic-plus" water infrastructure that serves both agricultural and domestic/livestock needs.

Source: Authors.

Table A1.10 Indicators of Social and Environmental Sustainability, Rural Infrastructure.

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Environmental impacts of construction/ infrastructure development and operations	Mitigation measures set out in EIA or EMP implemented Compliance with environment-friendly construction practices Principles of sustainable resources use and practices adopted	Changes to rural landscape (supporting indicators: reduced green cover, felled trees or cleared forest areas, leveled hills)	Visual aspects Perceptions of local population, including all groups	Perceptions of men and women Interview of local authorities	Changes to rural landscape Changes in surface water flow or groundwater level Changes to soil salinity and extent of water logging Changes to natural habitats (permanent or seasonal water bodies, wetlands, biodiversity, fish stocks) Changes to state or conditions of environmentally sensitive areas (for example, wetlands, coastal zones) Road accidents and other hazards	Overall environmental performance of subprojects	Environmental audit (assessment of environmental performance against EIA or EMP)
		Changes to soil salinity and incidence of flooding or water logging	Soil analysis Incidence of flooding (where and when over time)	Reports of local authorities Community monitoring committees			
		Dust and traffic air pollution from construction vehicles and equipment, and new traffic	Ambient dust Vehicular emissions	Contractors' reports Direct observation Community monitoring committees			
		Pollution of ground and surface water	Surface water quality (key water quality standards) Drinking water quality standards	Contractors' reports Random tests for water quality Community monitoring committees			
		Changes to natural habitats (supporting indicators: permanent or seasonal water bodies' effects on biodiversity, fish stocks)	Biodiversity assessments Hydrological assessments	Ecological studies Environmental monitoring reports	In-migration of people into area/region (and social consequences)	Population census	Census Local authority statistics

Table A1.10 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Risks to environmentally sensitive areas (for example, wetlands, coastal zones) (supporting indicators: water pollution, effects on biodiversity)	Plan provisions and results of implementation for protection of such areas	Ecological studies Environmental monitoring reports			
		Health risks to local population by in-migrant construction workers and easier access to towns (for example, HIV/AIDS, alcoholism)	Incidence of disease over time and area/ region	Surveillance by local health authorities			
Participation in project activities	Broad community (not only leaders) consulted in selection, planning, and design of infrastructure projects, including means of collecting local contribution	Requirements for local contributions of money, land, or labor realistic and accepted by majority Participation of community representatives in selecting construction contractors Infrastructure constructed or rehabilitated according to needs and desires of community, and alternatives considered	Tendering carried out according to regulations and transparently Local contributions available when needed, without causing undue socioeconomic difficulties Infrastructure in full use as anticipated by project plans	Community meeting minutes and records of prioritization and votes Bidding records Financial records Project MIS	Strengthened community involvement in planning, implementation, and monitoring results in better quality infrastructure. Functional users' groups or associations, including women, tenants and smallholder farmers as members, taking responsibility over adequate operations and maintenance	Organized action(s) and commitment of time/resources Water allocation program broadly consulted and agreed Family incomes increase High satisfaction levels of user groups	Sample surveys Case studies Institutional analysis

Table A1.10 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	No. and frequency of women's and other disadvantaged groups consulted during detailed design and implementation	Women's particular needs considered in infrastructure design and siting Ethnic groups consulted and their views incorporated, including presentation of information in local languages and using different media	Treatment of specific issues raised in design Information boards and other media used	Post-construction assessment Community meeting minutes and records of prioritization and votes	(O&M) of completed facilities (repayment service fees over time, replacement costs) Equitable allocation of water for intended uses (drinking water, agricultural) Equitable access to infrastructure developed Incomes improved due to improved agricultural productivity and access to markets.		
	No. of women and members of disadvantaged groups trained in various capacities	Women, indigenous peoples, and ethnic groups employed in various project activities	Number or % trained of each group	Project MIS or administrative records			
	Functioning participatory monitoring and evaluation system	Representative community members elected and actively involved in participatory planning and M&E	No. of monitoring visits carried out during construction Follow up of problems encountered No. of post-completion interviews held with users Satisfaction levels of community	Community meeting minutes Records of monitoring visits by community monitors and follow-up Records of interviews			

Table A1.10 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Institutional capacity	No. of users' groups trained and assisted in proper O&M of facilities	Users' groups established and functioning	Management structure elected leaders systems and procedures in place	Institutional analysis			
		Repayment of service fees and other dues	% per cropping season or year	Administrative records of users' groups			
		Women, indigenous peoples, and ethnic groups participating in users' groups; extent of their participation in O&M	Number or % to total membership Commitment of time/resources	Administrative records Case studies			
		Women, indigenous peoples, and ethnic groups in positions of management or leadership in users' groups	No. of positions occupied Commitment of time/resources	Administrative records Case studies			
		Optimal water allocation among various users (irrigation, domestic water supply)	Service coverage Farmers'/ community's level of satisfaction re water allocation	Administrative records Community monitoring committees			
	No. or persons or groups targeted by training or information campaigns on relevant	Local initiatives at farm level or by community (for example, users' group) to promote water conservation,	Individual or organized action(s) and commitment of time/resources	Key informant interviews Case studies			

Table A1.10 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	environmental issues	water reuse, or maintenance of water quality					
Displacement of people and livelihoods	Mitigation measures and compensatory mechanisms set out in Resettlement Plans implemented	Restoration or replacement of livelihoods of affected people (including women, indigenous people, and ethnic minorities)	No. of HHs or persons affected Extent of loss and replacement of homesteads and agricultural lands Results of implementation of RPs	Project MIS Census Sample surveys Case studies Community monitoring committees	Changes to livelihood sources (on-farm and nonfarm employment) among resettled men, women (esp. female-headed HHs) and other disadvantaged groups Changes to health status and education levels	% of annual HH income or food supply Presence and use made of facilities Perceptions of men and women	Sample surveys Case studies PRA SIA
		Displaced/resettled people employed in project activities	No. or % to total project staff	Project MIS or administrative records			
Indigenous peoples and ethnic groups	Mitigation measures and compensatory mechanisms set out in Indigenous Peoples' Plan (IPP) implemented	Affected people (including indigenous people and ethnic minorities) who have been resettled and whose livelihoods have been restored/replaced	No. of HHs or persons affected Extent of loss and replacement of homesteads and agricultural lands	Census Sample surveys Case studies	Changes to way-of-life, nutrition, and well-being of indigenous peoples and ethnic groups	Practice of traditional livelihood sources Perceptions of men and women	Case studies PRA SIA
		Loss, if any, of historic and cultural properties (burial grounds, ancestral land; any reparations carried out	Documented historical or cultural properties Results of implementation of IPPs	Public records Interviews of chieftains or elders Project MIS			

Table A1.10 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Sharing in project opportunities and benefits	Facilities constructed and operational	Access to services and facilities (irrigation, electrification, water supply, and sanitation) by women, indigenous peoples, and ethnic groups	Membership in users' groups	Administrative records Sample surveys PRA Community monitoring committees	Contribution to annual HH income or food production among female-headed HHs and other disadvantaged groups Changes in HH resource allocation for securing water and other services Changes to livelihood strategies (diversification) brought on by having a secure water supply Changes to health status and education levels Position of women in HHs re: control over finances/resources and decision-making	% of annual HH income or food supply % of annual HH budgets spent on water/other services Extent of livelihood diversification Perceptions of men and women	Sample surveys Case studies
		Time spent or distance walked by HH members to collect potable water	By gender and age	Sample surveys PRA			
		Access to public/ private sanitation	Presence and availment of facilities	Sample surveys PRA			
		Changes to transport, handling, and storage costs for disadvantaged groups involved in marketing surplus produce	Cost or no. of days spent in marketing produce	Sample surveys Case studies			
	Infrastructure utilized efficiently, to ensure economic viability	Incomes increase and become more stable throughout year through changes in crop types and application of irrigation. Improved access to markets increases incomes.	Volume and value of high-value crops produced and sold	Agricultural extension records Sample surveys			

Sources: Authors.

K. Smallholder Agriculture

Typical subcomponents in WB-supported projects:

- Crop and livestock production (subsistence, cash crop, and organic farming on smallholder farms)
- Lowland, irrigated agriculture and upland, rainfed agriculture
- Sustainable farming practices such as mixed farming (crop production with livestock, fish production, fruit trees); multiple cropping; intercropping; rotations growing green manure crops; biological control; terracing; composting and organic manure; integrated pest management; and sustainable use of agrochemicals
- Establishment of farmer organizations
- Advisory and financial services
- Marketing support.

Smallholder agriculture typically has parallel aims of improving sector productivity for overall economic growth and socioeconomic development.

Box A1.11 Environmental and Social Considerations in Smallholder Agriculture

Environmental issues

- In contrast with alternative species, promoting cultivation of less suitable crops that require extensive amount of water, fertilizers, pesticides or space, or for which the processing may need a lot of energy or pollute the environment if proper methods are not applied (for example, coffee, cotton, cocoa, oil palm, rice, sugar and tea), or which do not provide nutrition for the malnourished population of the region (tobacco, cash-crops).
- Pollution of water bodies from fertilizers, pesticides, and herbicides improperly used in nurseries and farmlands.
- Lack of experience or capacity of graziers to understand optimal stocking rates and carrying capacity of rangelands.
- Loss of valuable natural habitats and decreasing biodiversity due to the clearance of forest land for agriculture purposes/intensive production may reduce pressure to clear land.
- Modification of natural species diversity as a result of the transformation to monoculture practices.
- Wind and water erosion, dust storms, drifting sand, and loss of soil fertility due to poor agricultural practices (plowing on steep slopes and erodible soils, lack of wind breaks, plowing furrows at 90 degrees to contour lines, inappropriately used irrigation).
- Dispersal of water pollution and nutrient load from the fields due to lack of buffer strips and wetlands along streams.

Box A1.11 ***continued***

- Machinery used for cultivation, harvesting, and transportation may cause pollution and other damage to the environment.
- Lack of experience in use of irrigation may result in water wastage. Construction of even small dams may result in water flow changes downstream.

Social issues

- Lack of well-developed extension service or other outreach institutional structure for education and technical assistance.
- Insecure land tenure or lack of other forms of ownership that discourage a sense of responsibility for the resource(s).
- Practices being required for loans or credits involve structures or equipment beyond the means of the owners in small-scale operations.
- Installation and maintenance of irrigation works require planting high-value crops to defray costs. These crops may lead to positive socioeconomic development. These crops are, however, also higher risk and they are taking the place of subsistence crops for family and local use.
- Occupational health problems, such as intoxication from unsafe pesticide use.
- Dislocation or involuntary resettlement of people off farmlands may result in long walks to arable land every day.
- Lack of attention to the differential access of male and female farmers to technologies and inputs.
- Weak or nonexistent provisions for dialogue between farmers and agricultural researchers results in little on-farm or smallholder-relevant research.
- Impact of sickness and death from HIV/AIDS (and malaria) is limiting labor available for agriculture, particularly as women or children often are left to work as well as care for sick relatives. Labor saving techniques and high nutrition crops are needed in countries in which these diseases cause high morbidity and mortality.
- Marginal farmers traditionally resist new ideas or technologies as they do not have the luxury of being able to make mistakes—they have no economic buffer.
- Increasing population pressure can make previously successful farming methods, such as slash and burn, no longer sustainable. However, it may take longer for indigenous communities to understand that the time for some methods is gone and that they must adopt sustainable methods.

Source: Authors.

Table A1.11 Indicators of Social and Environmental Sustainability, Smallholder Agriculture

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Agricultural technology and farming practices (farm-level) ***(Refer also to Agricultural Research, Extension, and Education matrix and Rural Infrastructure matrix.)***	Training and awareness-raising provided to men and women on farm-level environmental issues, sustainable farming practices Credit and other support services provided to promote use of sustainable technology and farming practices Women and members of indigenous/ethnic groups trained to obtain enhanced employment opportunities	Changes in awareness among men and women farmers of environmental implications of farming practices	Knowledge level of local environmental issues Perceptions of men and women	Focus groups PRA	Stability of farm-level productivity and returns over time Maintenance of farm-level soil fertility and vegetative cover over time Maintenance of quality and flow levels of watercourses Changes in the ecological footprint (land area required to support a particular spatial unit such as a community, region, or country) Extent of wastelands as a result of poor agricultural practices Extent of eutrophication of watercourses	Farm-level cost/benefit analysis (environmental and economic assessments) Soil analysis Vegetative cover Water quality analysis Rate of forest clearing for shifting cultivation Extent of recycling/reuse in farms and at community level Ha in cultivation per inhabitant % of abandoned land compared with productive areas Agrochemicals used per area	Sample surveys Expert interviews Statistics/records of local agricultural, forestry, and environmental authorities Case studies Interviews of community leaders, local and environmental authorities Land use and population statistics Agrochemical statistics Expert interviews
		Adoption by men, women, and other disadvantaged groups of recommended practices/ technologies such as: • Composting and organic manure • Multiple cropping, intercropping, and rotations • Minimum tillage and fallow periods • Agroforestry and sylvopasture • Biological control • IPM • Terracing and other slope stabilization measures • Appropriate irrigation use	Extent of adoption or nonadoption among men and women farmers Farm-level cost/benefit analysis of farming practices/ technology	Field surveys Case studies PRA			
		Changes to HH-level food and cash crop production, yields, and returns over time					

Table A1.11 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
		Changes to physical and chemical properties of soil and water at farm level	Soil fertility and extent of vegetative cover over a cropping year Incidence of soil erosion, water-logging	Field surveys Case studies			
		Changes to practice of slash-and-burn cultivation by indigenous and nonindigenous farmers	Rate of forest clearing for shifting cultivation	Interviews of forest authorities Forest statistics			
		Farm-level recycling/ reuse of organic wastes such as biomass and biogas	Extent of recycling/reuse at farm level	Field surveys PRA			
Off-farm environmental impacts (area wide or community level)	Support services provided promoting intensive crop-livestock, agroforestry, or fisheries production	Recycling/reuse of organic wastes such as biomass and biogas	Extent of recycling/reuse at area or community level	Field surveys PRA	Changes to soil fertility and vegetative cover over time Extent of soil erosion and incidence of landslides on slopes over time Loss or maintenance of habitats (for example, wetlands) and consequent effects on wildlife populations and biodiversity	Soil and water analysis Incidence of landslides and flashfloods; consequent damages over time New settlements in forest areas No. of livestock per ha	Expert interviews Statistics from relevant authorities Interviews of local environmental and agricultural authorities Participatory environmental monitoring
		Changes to sediment and nutrient flows into watercourses	Surface and groundwater quality	Field surveys Expert interviews			
		Risks to environmentally sensitive areas such as wetlands, coastal zones	Habitat status, biodiversity, threatened species	Ecological assessments Community monitoring committees			

Table A1.11 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Degraded areas rehabilitated, such as areas reforested or grazing lands improved	Changes to productive uses of land over time	Productive uses of previously degraded lands	Field surveys Expert interviews	Cumulative impact of sediment load and nutrient flow (eutrophication) in water bodies on fish and other aquatic population In-migration of people into the area or spread of permanent settlements into forest areas Changes to carrying capacity of pasture areas and rangelands		
		Changes to carrying capacity of pasture areas and rangelands	No. of livestock per ha	Animal census figures Farmer interviews			
		Extent of protection of critical areas over time	Vegetative cover Control of productive uses	Vegetation (for example, forest) and animal inventory			
Participation in project activities	Training and capacity building provided to men, women, and other disadvantaged groups (no. of persons trained)	Consistency of participation over time by affected groups, including poor HHs, women, indigenous groups, and ethnic groups in design, detailed planning, construction, and O&M	Level and degree of involvement (time allotted; contribution; leadership/ management positions) over time	Project MIS or administrative records Case studies PRA	Local capacity for self-governance and participation in local decision-making	Level and degree of involvement (time allotted; contribution; leadership/ management positions) over time	Case studies Institutional analysis
Displacement of people from farmlands	Mitigation measures and compensatory mechanisms set out in Resettlement Plans implemented	Restoration/ replacement of livelihoods for affected people (including indigenous people and ethnic minorities)	No. of HHs or persons affected Extent of loss and replacement of homesteads and agricultural lands	Census Sample surveys Case studies	Socioeconomic situation of resettled groups or communities in terms of livelihoods, health, and education	In comparison with pre-resettlement situation	Sample surveys Case studies SIA

Table A1.11 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
Indigenous peoples and ethnic groups	Rural infrastructure facilities (including irrigation and roads) constructed and services delivered in upland and remote areas Support services provided promoting expansion or intensification of agricultural/ agroforestry/ fisheries production Studies carried out into the viability and sustainability of traditional farming practices Recognition of traditional land, forest, and water access and user rights via support to mapping and titling	Improvement in economic viability of farming in upland or remote areas Changes to access rights for common property resources in forests, rangeland, coastal and inland fisheries Proven benefits and weaknesses of traditional farming practices vis a vis sustainable agriculture principles	Changes in family incomes from farming Extent of access issues Implications for sustainable resource management	Sample surveys Case studies PRA Maps and titles	Changes to the way-of-life and well-being of indigenous peoples and ethnic groups Dissemination of indigenous or traditional practices that promote sustainable resource use	Practice of traditional livelihood sources Perceptions of men and women Uptake of indigenous/ traditional practices	Case studies SIA
Sharing opportunities/ benefits from the project	Farm support services provided to men, women, and ethnic/ indigenous farmers, such as credit, extension, training	Per capita or HH staple crop production as a % of annual requirements	% of HH annual staple food requirements	Sample surveys PRA	Contribution of farming/fishing/forestry to HH income or food production among male- and female-headed households and other disadvantaged groups	% of annual HH income or food supply Underweight (weight relative to age), stunting (height relative to age), or wasting	Sample surveys Case studies Rapid nutrition surveys Gender analysis
		Proportion of annual HH income (or consumption) derived from farming, fishing, or forest activities	% of annual HH income (or consumption)	Sample surveys PRA			

Table A1.11 *continued*

Critical sustainability issues	Component and activity level (output indicators)	Project development objective and component level (outcome indicators)	Measurement/ assessment	Tools/ methods	Development goal level (impact indicators)	Measurement/ assessment	Tools/methods
	Social support services provided	Gender differences in workload as a result of introduced practices or new technology Access to health, education, water, and sanitation facilities	Shift in roles between men and women in productive and HH activities Availment and *use* of facilities/ services	Sample surveys Case studies PRA	Nutritional status of children under 5 years Position of women in HHs in terms of control over finances/resources and decision-making	(weight relative to height) Perceptions of men/women	

Sources: Authors.

Appendix 2. Fact Sheets on M&E Tools and Methods

Fact Sheet 1. Sample Survey	
What is it?	Structured, systematic way of gathering factual data on a given population (for example, project beneficiaries) based on a "sample" of households or individual respondents. The sample should be as representative as possible of the full population to make conclusions about characteristics of the whole population.
What can it be used for? What are the benefits and challenges of using this tool?	Gathering data from the entire population (that is, a census) is not always feasible or practical—especially if the project area spans vast geographic areas, or if time, resources, and funds are limited. Sample surveys are the next best alternative. Sample surveys are very good at capturing factual data on the demographic characteristics of the target population such as age, sex, household size, educational attainment; how people live—consumption patterns, income sources, dependence on natural resources; and what people's beliefs, opinions, and attitudes are. For various reasons, sample surveys often are considered the default method for M&E work. They provide comprehensive vital information about the target population. If done properly, they lead to conclusions being drawn about the entire population based on trends and patterns of change within the representative sample. Sample surveys often form the basis for socioeconomic studies; and for ex-ante, baseline, and ex-post analysis of projects. There are, however, many challenges the use of sample surveys for M&E work. Foremost is that they require enormous resources—time, staff, funds, and expertise—to undertake from start to finish. Depending on the sample size and scope of the study, a survey may easily take 3–6 months to complete (even longer in exceptional cases) from survey design to training interviewers to conducting the survey and on to data processing/analysis, and report writing). There also is a tendency to collect more information than what is warranted due to poor survey design, which contributes to the cost and the time required to complete a survey. In addition, some time may pass before the survey report becomes available, leading to a delay in recognizing the significance of the findings or the urgency of issues identified in the survey.
What does it tell you?	The WB's Living Standards Measurement Study (www.worldbank.org/LSMS/) is a widely used system for undertaking surveys. The main objective of LSMS surveys is to collect household data that can be used to assess household welfare, understand household behavior, and evaluate the effects

	of various government policies on the living conditions of the population. Accordingly, LSMS surveys collect data on many dimensions of household well-being including consumption, income, savings, employment, health, education, fertility, nutrition, housing, and migration. Three different LSMS questionnaires are available: the household questionnaire, which collects detailed information on HH members; the community characteristics questionnaire, in which key community leaders and groups are asked about community infrastructure; and the price questionnaire, which questions market vendors about prices. A fourth type of questionnaire—school or health facility questionnaire—also is available. (See LSMS website.)
Key elements	Choosing a sample influences the quality of the final results of the study. If the sampling method is biased or the sample too small, the results will be less reliable or perhaps even invalid. It is therefore crucial to take care of the following factors: • Clarify sampling frame (complete list of all possible individuals or units who may be selected in the sample) • Decide on an appropriate sample size (time, budget, and resources available; variation within a population; acceptable sampling error) • Select sampling method (whether random or nonrandom based on information required) Interviews are based on either formal or informal instruments, such as a questionnaire. Designing and implementing the questionnaire involves initial design and planning; designing the questionnaire; pre-testing it; final design and planning; data collection; and analysis and reporting.
Applicable scale	National, subnational, or local.
Timing	Baseline and, if resources are sufficient, at mid-term and completion of the project.
Data requirements	Primarily quantitative; also can capture qualitative information.
Useful links	WB Living Standards Measurement Study (LSMS), www.worldbank.org/LSMS/
References	International Food and Agriculture Development. 2002. "Managing for Impact of Rural Development: A Guide for Project M&E." Office of Evaluation and Studies, IFAD. Nichols, P. 1991. *Social Survey Methods: A Fieldguide for Development Workers*. Development Guidelines no. 6. Oxford: Oxfam Publications.

Case Example: Sample Survey

Qinghai Forestry Resource Management Project, People's Republic of China (AusAID)

Description of project

The Qinghai Forestry Resources Management Project (QFRMP) is a joint project of the Governments of China and Australia. The project tackles the linkages between environmental degradation and poverty that are a feature of the socioeconomic conditions in Qinghai. The project is being implemented in four counties of the Huangshui River catchment from 2002–07.

Objectives: The three key project outputs are strengthened forestry planning and management, developed and demonstrated improved management of forest land, and efficient and effective project management. The capacity building and demonstration activities take place in subcatchments of four counties (Huzhu, Ledu, Huangzhong, and Ping'an) that are representative of the range of environmental and social problems in the catchment.

Sample surveys in M&E

The project's M&E framework provides for mid-term and end-of-project Socioeconomic Review Reports to establish the overall socioeconomic impacts of the project based on secondary data of overall socioeconomic trends in the project area and longitudinal sample surveys.

Socioeconomic Baseline Studies (SEBS) have been conducted in the 4 demonstration areas (2 counties in 2002 and 2 in 2004). The 2002 and 2004 questionnaires had no questions relating to the environment, specifically on the knowledge and attitudes toward environmental issues, which the project is trying to resolve.

To inform the project Mid-Term Review, a resurvey of the 2002 villages was carried out in 2005 using the questionnaire used in the 2004 SEBS, which was a shorter version of the 2002 SEBS with the environmental questions added The intention is to use the same questionnaire for the final evaluation at the end of the project.

Results

The 2005 resurvey of the two demonstration areas (Shagou and Dacai townships) covered by SEBS in 2002 enabled the project to glean early indications of project outcomes. The resurvey looked at the effects so far on poverty alleviation, reasons for the effects observed, and environmental knowledge and attitudes. The main findings were:

- Overall average income for sample households increased from RMB3,721 in 2002 to RMB5,576 in 2005, an annual increase of approximately 16 percent.
- Incomes of the Poor and Average households increased, while the Better-off households stayed the same.
- There were one-third fewer Poor households in 2005.

The group of Poor households who moved up to Average was compared against the Poor who remained Poor. In addition, the group of Average households who fell to the Poor category was compared against the group of Average households who remained Average. Selected independent variables were then tested for significance as factors contributing to the change in category of income of each of the two groups who had moved up or down a category. The key findings were (1) more than half of the Poor households in 2002 were lifted out of poverty by 2005, and (2) just under half the Average households in 2002 dropped into the poverty zone by 2005.

In terms of sources of income, the Poor households who moved to Average increased their off-farm employment more than the Poor households who stayed in the Poor category. In terms of changes in other sources of income, a key finding for most groups was that livestock ownership had decreased (except for the poor who stayed poor).

On environmental knowledge and attitudes, the farmers in both counties were well aware of their damaging interactions with their environment, but subsistence contingencies—feeding their families and earning an income—meant that they often felt that they had little alternative.

An analysis of available secondary data indicated that, overall, the incomes of rural households in project demonstration areas increased more rapidly than those of the surrounding rural population.

Source: ANZDEC Ltd., various years.

Fact Sheet 2. Case Studies

What is it?	Informal social research method to document the life story or sequence of events over time related to a person, location, household, or organization to obtain insight into a project's impact. (IFAD 2002)
What can it be used for? What are the benefits and challenges of using this tool?	Case studies are a practical means of gaining insights into changes brought about by planned interventions—for example, how people deal with change and why change occurs in specific ways—and to learn about people's experiences, dreams, and obstacles to tailor future planning. From an M&E perspective, case studies add life to what might otherwise be data without a human face and they allow for an in-depth understanding of the context and human factors behind general or summarized data collected through other means. The strength of this method is that much detail is obtained on a specific topic. The need for a focused case study can arise from a general survey in which a particular issue emerges as needing more in-depth elaboration. Case studies can provide interesting perspectives that can be gained only through a closer look at the overall situation (or life story) of a person, household. However, case studies generally are anecdotal. For this reason, it is wise to use case studies in combination with methods involving larger samples, such as surveys or questionnaires. (IFAD 2002) A case study looks in depth at a '"typical case." Although a case study will not give generalized statistical data, it can provide valuable insights. A skilled researcher who can encourage people to talk can reveal a rich and lively picture (Nichols 1991).
What does it tell you?	Case studies ask "how?," "what?," and "why?" Case studies can provide much important background and human context for data that are generated by other methods. A cross-case study analysis can be highly valuable, particularly if it relates to broader policy questions of major interest. A case study is particularly useful in complex situations in which many variables interrelate and outcomes and impacts are liable to vary across different populations. A variation of case study method is to analyze the traditional form of story-telling as an entertaining way to understand how a people deal with issues or crises. Storytelling often is an important part of village life in communicating ideas and community values. However, since a story is often a metaphor and open-ended, it needs careful thought to be useful. As with other methods, the information must be carefully recorded. (IFAD 2002)
Key elements	• Question list to guide the information collection. • Documentation of findings through written or filmed account of observations and answers. • Good interviewer/recorder, whether a person from outside or inside the community. • In more participatory processes, the study is carried out by (a group of) individuals on themselves or one another. • Control group for comparison.

Applicable scale	Local: Household, community, or organization; also applicable to places of special interest.
Timing	Repeat the discussions often enough to enable an up-to-date picture of changing conditions. Frequency will depend on the rate of change of the issues in which the researcher is interested. (IFAD 2002)
Data requirements	Primarily qualitative, collected repeatedly over the life of the project.
Useful links	
References	International Food and Agriculture Development. 2002. "Managing for Impact of Rural Development: A Guide for Project M&E." Office of Evaluation and Studies, IFAD, Rome. Nichols, P. 1991. *Social Survey Methods: A Fieldguide for Development Workers*. Development Guidelines no. 6. Oxford: Oxfam Publications.

Case Example: Case Studies

Qinghai Forestry Resource Management Projec, People's Republic of China (AusAID)

Description of project

Objective: The Qinghai Forestry Resources Management Project (QFRMP) is a joint project of the Governments of China and Australia. The project tackles the linkages between environmental degradation and poverty that are a feature of the socioeconomic conditions in Qinghai. The project is being implemented in four counties of the Huangshui River catchment from 2002–07.

The three key project outputs are strengthened forestry planning and management, developed and demonstrated improved management of forest land, and efficient and effective project management. The capacity building and demonstration activities take place in subcatchments of four counties (Huzhu, Ledu, Huangzhong, and Ping'an) that are representative of the range of environmental and social problems in the catchment.

Case Studies in M&E

The project's M&E framework provides for mid-term and end-of-project Socioeconomic Review Reports to establish the overall socioeconomic impacts of the project based on secondary data of overall socioeconomic trends in the project area and longitudinal sample surveys. Socioeconomic Baseline Studies have been conducted in the 4 demonstration areas (2 counties in 2002 and 2 in 2004).

Analysis of the baseline socioeconomic studies carried out in 2002 indicated that certain areas of potential project impact had not been well covered in the baseline surveys. These included training achievements, adoption of improved practices (mainly in farming systems), and associated changes in household income. For this reason, the project decided to undertake purposive case studies to capture the full breadth of potential project impacts not well covered in the socioeconomic surveys.

So far, case studies have been carried out to analyze the vocational training impact, and the impact on household incomes or livelihoods of the following project interventions: widening village pathways, revolving credit fund, introducing solar stoves, and vocational training for farmers.

The case studies were carried out by the China Agriculture University in Beijing.

Additional case studies are planned to investigate gender issues, attitudinal change among farmers and officials, training achievements, adoption of improved practices and associated changes in household income, and further expansion of these practices either on own farm or via farmer-to-farmer extension. Proposed topics for future case studies are cross-cutting issues such as gender equity with particular reference to interactions with ethnicity, the scale and effect of migration, and the use of agricultural chemicals and plastics.

Results from Case Studies

The key findings of completed case studies are posted on the project's website (www.qfrmp.com), enabling the project to provide early indications of the socioeconomic and environmental outcomes of its various interventions.

The case studies complement to the longitudinal sample surveys taken at baseline, mid-term, and end of project. The shorter duration case studies enable the project to pick up trends and changes in patterns of behavior among the target communities in the demonstration areas resulting from project activities that the more rigid sample surveys may not be able to capture.

Source: ANZDEC Ltd, various years.

Fact Sheet 3. Key Informant Interviews

What is it?	Key informant interview is a one-on-one dialogue with an individual recognized or designated as a community or institutional leader about a specific topic or issue. A key person might be an opinion leader, community spokesperson, elected official, head or key advisor of an organization, or local media representative.
What can it be used for?	• The goal is to learn about the person's views and locality, and his/her perceptions of the program or activity, the planning or development process, and the political setting in which work is being done. • Key individuals are likely to have knowledge, wisdom, and insight that can help a project. • Interviews are a good way to introduce project personnel to the community before beginning a public participation process and to build a network of critical contacts. • These individuals demonstrate whether community members are interested in the project or whether it is relevant to them. • The dialogue can be used to clarify the interviewer's ideas or understanding (for example, to follow up reasons for unexpected quantitative outcomes) and for triangulation with other methods.
What does it tell you?	Key informants often provide more detail on political or emotional aspects of an issue that are difficult to discuss in a public meeting.
Key elements	• Ideally, interviews of key informants should be conducted on site, but they may be done via telephone or written questionnaire. • A list of key informants should be identified via a range of sources—people who have good awareness of the issue and have thought it through. Ideally, key informants should represent a cross-section of the community (consider gender, age, ethnicity, employment). • Explain the purpose and the process to the interviewee and establish rapport. • Normally, the questions are predefined. However, open-ended questions to probe for more in-depth answers might also be used. Start with factual questions; then move to those requiring opinions and judgments. • If the interviewer is unsure about the topic or what is important to the community, open-ended interview questions may be used early in the process; later, the questions can become more focused. • Ideally, key portions of the testimony are recorded in the informant's exact, or nearly exact words, to preserve the "flavor" of the discussion.

Applicable scale	Ideally at local level, but useful at all levels
Timing	• Key informant interviews are useful both at the start of a process and just prior to decision-making. • Interviews help evaluate projects or proposals or help monitor the process itself. • The interviews can be one-off, or repeated interviews of the same persons.
Data requirements	Qualitative, although the results can be coded for MIS
Useful links and references	US Dept. of Transportation. N.d. "Key Person Interviews." www.fhwa.dot.gov/reports/pittd/keypers.htm USAID. 1996a. "Conducting Key Informant Interviews." Center for Development Information and Evaluation. www.usaid.gov/pubs/usaid_eval/ascii/pnabs541.txt

Case Example: Key Informant Interviews

Supplementary Appraisal of the Tree Planting Subcomponent, Uganda Farm Income Enhancement and Forest Conservation Project—Uganda (Nordic Development Fund/African Development Fund)

Description of project

Objective: The project comprises three main components: (1) Forestry Support, with two subcomponents (Community Watershed Management; and Tree Planting); (2) Agricultural Enterprise Development, with four subcomponents (Soil Fertility Management; Small-Scale Irrigation and Crop Development; Apiculture Promotion; and Agricultural Marketing); and (3) Project Coordination and Management. The Nordic Development Fund (NDF) received a formal request to finance the Tree Planting subcomponent. A series of preparation missions by African Development Fund (ADF) staff and local consultants resulted in the preparation of an Appraisal Report. Other supporting documents include aides-mèmoire; project component costings; a financing plan; and Working Papers on a range of issues including environment, gender, project management, and a watershed work plan.

NDF and its Lead Agency, ADF, considered that further definition of the Tree Planting subcomponent was required prior to presenting the project to the NDF Board for its approval in principle for funding

Use of key informant interviews

There had been some disagreement between stakeholders during the project formulation and approval process, and it was considered important to conduct this supplementary appraisal. The consultant worked with the ADF to establish a list of key informants to interview.

A series of key informant interviews were conducted as part of the supplementary appraisal. The purposes were to:

- Collect necessary additional information/data for the subcomponent program document
- Assess the relevance and the institutional context in which the project would operate

- Establish good working relations with the stakeholders and ensure that their opinions were recognized and considered
- Clarify the organizational structure, and procurement and disbursement arrangements of the subcomponent; establish the likely stakeholders/direct beneficiaries
- Cross-check opinions regarding the suitability of the subcomponent in light of the ongoing reform; ensure no likely geographic overlapping of activities or local staffing/facilitator needs with other projects
- Review the criteria used for selecting the participating districts
- Avoid any overlap/duplication; seek a complementary approach within the context of a coherent framework of management and development opportunities in the sector.

Following the interviews, a proposal was drafted and discussed in a working session with government officers. The proposal was improved and later circulated to project stakeholders (including the key informants interviewed) for comments, and a stakeholders' feedback meeting was held. The suggestions were incorporated into the final proposal, or feedback was given to the stakeholders.

This process was very useful because it enabled the concerns and recommendations of the key informants to be recognized and taken on board during the planning process. The document was amended as appropriate, and was approved by the government and donors.

Sources: ADF 2004, experiences of HCG staff.

Fact Sheet 4. Focus Group Discussions

What is it?	Means to gather people from similar backgrounds or experiences to discuss a specific topic of interest. The group is guided by a facilitator, who introduces the topics and encourages full participation.
What can it be used for?	• An FGD enables participants to agree or disagree with each other, so provides insights into group perceptions of a topic. • It is a useful step for researchers prior to designing written questionnaires, as they gain some understanding of the breadth of potential responses. • It can be used for testing hypotheses or questionnaires. • It can be used to explore in detail unusual or unexpected results from survey. • Focus groups elicit a multiplicity of views and emotional processes within a group context in a way that individual interviews cannot. • It also can be used to gather local terminology or beliefs for research purposes. • An FGD can be used as an individual monitoring activity or to complement other methods, especially for triangulation and validity checking.
What does it tell you?	It enables expression and collection of a range of opinions, beliefs, and ideas
Key elements	• The main objective/s of the FGD, key questions, and agenda should be established prior to the meeting. • Identify and invite 6–10 suitable discussion participants. They should be neither too homogenous nor too heterogeneous, and able to interact comfortably with one another (issues of language, class, power, gender, culture must be considered). Usually, they should have some characteristics in common. • The facilitator is crucial. S/he must explain the process and purpose, ensure equitable participation opportunities for all, and remain neutral in attitude and action. • Open-ended questions are asked in a way to trigger group discussion. • The results should be recorded by a note-taker, who does not participate in the discussion. • If the FGD works well, it can be empowering for the participants.
Applicable scale	An FGD be carried out at any level but is best with a small group. It also can be done online.
Timing	Focus groups can be used at the preliminary stages of a study or program; during a project or study, perhaps to evaluate or develop particular activities; or after a program or study has been completed to assess its impact or to generate additional avenues of work.
Data requirements	Qualitative data is produced in reports following the discussion.

Useful links and references	Start, D., and I Hovland. 2004. "Tools for Policy Impact: A Handbook for Researchers." Research and Policy in Development (RAPID), ODI. www.eldis.org/cf/search/disp/docdisplay.cfm?doc=DOC16876andresource=f1 Gibbs, A. 1997. "Social Research Update: Focus Group Discussions." www.soc.surrey.ac.uk/sru/SRU19.html Dick, R. N.d. "Resource Papers in Action Research." www.scu.edu.au/schools/gcm/ar/arp/focus.htm

Case Example: Focus Group Discussions

Plan Rector Nacional de Educaciōn y Capacitaciōn Forestal (Support for the Strategic Plan for Forestry Education and Training) 2004–2025, Mexico (Ministry of Agriculture and Forestry of Finland)

Description of project

Objective: The program was an effort of the federal government of Mexico through the National Forestry Commission (CONAFOR) to define a set of strategies for forestry education and training to year 2025. This program is part of the Strategic Forestry Program (Programa Estratégico Forestal - PEF) to year 2025. To prepare this program, a national diagnostic and 3 basic studies were conducted, including focus groups, plus 5 participatory workshops in different forestry regions. Additional information was gathered from direct interviews of experts, a website discussion, and other workshops implemented by CONAFOR. Global coordination of the analysis was the responsibility of the General Coordination of Education, Training, Research and Forestry Culture of CONAFOR.

Use of focus group discussions

Forestry education and training have been conducted in Mexico since the mid-1800s. These activities, however, have not responded effectively to the nation's needs. The criticism has been that they have been isolated, locally or regionally focused, and always associated with short-term strategies. The strategic participatory planning process was an attempt to look at what had been done, analyze the results and problems, and come up with a vision and plan strategies for the future.

The objective of using focus groups as a tool was to test ideas and gather basic information from key participants. Groups of persons from similar backgrounds were gathered to discuss a particular topic—for instance, representative staff at the same level from similar institutions across the nation such as directors of forestry training colleges. Ground rules were established: participants were asked to concentrate on the common ground, rather than argue over issues on which they disagreed. They were asked to give their opinions in a maximum of three minutes per time. They also should abandon their normal roles of expert or boss, respect the facilitator and the process, participate in the process, and not try to change the methodology. A note-taker captured the discussion points and outcomes.

A topic was nominated for each group. For instance, one group dealt with capacity building in forestry; another looked at technical/vocational forestry training, and another at the development of a forest culture. Open-ended questions were used to stimulate discussion. The facilitator then summarized the discussion and fed it back to the group for their approval. The group also considered what had happened in the past and what would be their vision for the future, along with potential strategies to

achieve this. Later, the information gathered in these small groups was presented to larger stakeholder meetings for validation and further discussion.

Results of focus group discussions

The process was very useful in incorporating the views of experts in their field: learning from past experiences and developing the future plan. The comments that they provided really reflected the reality in the field.

However, this was an enormous, national process, so it was impossible to incorporate representatives from absolutely all areas and potential sectors. Doing so would have taken too much time. In addition, the participants' expertise levels quite a lot, even within the focus group, so it was a bit difficult to find common ground and ensure that the experiences of everyone were recognized. This process needed careful facilitation. Compiling all the materials from many groups was a labor-intensive process. Reports then had to be submitted to many stakeholders and focus groups for feedback and comments.

Sources: CONAFOR 2004, other project documents, experiences of HCG.

Fact Sheet 5. Community Group Interview

What is it?	Series of set questions and facilitated discussion in a meeting open to all community members used to gather views and feedback of beneficiaries and other stakeholders to be used by decision-makers, and to disseminate information to the community.
What can it be used for?	• Establish what the key problems of a community and potential solutions. • Provide qualitative data on complex socioeconomic issues and changes, and community views and opinions. • Discuss potential project or activity ideas and improve planning. • By consulting the community, they are more likely "buy in" any proposed solution or activity. • Validate ideas and strategies. • Collect feedback on the process or outcome of an activity and make adjustments for future activities based on that. • Disseminate information the community on a process, activity, or decision.
What does it tell you?	Community group interviews allow project managers or community leaders to understand the diversity of opinions within the community and gather feedback quickly on an activity or program.
Key elements	• Record the numbers of persons in the meeting and disaggregate the data according to gender, ethnicity, and poverty status. This record shows whether this meeting represents a genuine cross-section of the community or a specific interest group. • Explain well the purpose of the interview and how the results will be used. • Can use techniques such as brainstorming, voting, prioritizing, group discussion, and open and closed questions. • Good facilitation skills are needed to create a "safe" environment, where different views are encouraged. • It is important to try to draw out both the "official" and unofficial' viewpoints—by encouraging the active participation of women and men, young and old, all ethnic groups, those of different jobs or status in the community. • A large group discussion is not always the best tool to facilitate participation. Often, only certain categories of people will talk, offer their arguments, or ask questions. In many settings, young people or women will not talk in front of older men. Many topics cannot be discussed openly in public. If this would be a problem, smaller, select groups might repeat the process. • It is useful to provide visual tools as well as verbal—for instance, photographs, or drawings—or to walk around an area prior to the discussion.

	• A community group interview is more general than a focus group. Usually, a diverse group is interviewed rather than one with similar backgrounds. • Considerations of timing, location, and comfort levels of group members are important. For instance, if an initial community group is found to consist of mainly men of a ruling caste, it might be worth holding a later session at a different time or location, or to deliberately invite certain additional groups.
Applicable scale	Can be used in all settings. It is most common in local settings but also is used right through to national activities, with diverse groups of stakeholders.
Timing	Used at all stages to collect stakeholder views—identification, planning, monitoring, and evaluation.
Data requirements	Qualitative data mainly, although quantitative data also is recorded, such as the type of participants.
Useful links and references	World Bank. 2004. "Monitoring and Evaluation: Some Tools, Methods and Approaches." Operations Policy Dept. Bessette, G. "Involving the Community: A Guide to Participatory Development Communication." Southbound/IDRC. www.idrc.ca/en/ev-52226-201-1-DO_TOPIC.html

Case Example: Community Group Interview

Sustainable Livelihoods Project, Mongolia (World Bank, JSDF)
Description of project Objective: The Sustainable Livelihoods Programme (SLP) includes 3 components, 2 of which are subject to application of the PM&E system: the Local Initiatives Fund (LIF) and the Pastoral Risk Management (PRM) components. The LIF involves the selection in community meetings of various subprojects of construction or renovation of facilities (for example, school dormitories, health clinics), or purchase of equipment (such as motorbikes for doctors' use). The LIF then funds the implementation of the subproject and the handover to the community. The PRM component aims to strengthen the capacity of rural families, particularly herders' households, to manage risk arising from drought and *dzud* (snow disaster) that adversely affects their livelihoods. Activities are implemented under the subcomponents of risk forecasting, early warning, and response planning; pasture land management and usage; support of herder groups and cooperatives; and hay and fodder production and management. **Use of community group interview** As part of the Participatory Monitoring and Evaluation system, a Quick Community Assessment tool was developed. It should be used in any sort of community meeting to gather feedback and views on subprojects implemented by the SLP. Because opportunities for meetings are rare in rural Mongolia, it is important to make the most of any opportunity to gather information or feedback. This method does have the drawback that it will not necessarily collect a fair cross-section of views, because some groups may never attend meetings.

The basic data on meeting participants is recorded (location, number of participants, number of households in the area, gender, poverty status, ethnicity). The participants are asked a series of questions. For the initial questions, they are instructed to raise their hands for "yes," "no," and "don't know" (topics on their knowledge of the project, whether the activity was discussed earlier). Then for each subproject implemented during the previous period (for instance, purchase of an X-ray machine for the clinic, repair of a road, renovation of a community hall heating system), the participants are asked to raise hands if they have used the new or renovated facility or service, and whether they are satisfied with the outcome. The facilitator then asks questions about the process, problems that arose, how they were dealt with, and ideas for future activities.

The tool seems to produce useful feedback with minimum extra time and effort. The facilitator should not be a project staff member, nor ideally a local government representative (as the intent is to collect unbiased responses), but rather the community mobilizer or another community member. However, the choice of facilitator is difficult to control. In addition, to encourage responses from all participants of the meeting, further training is probably needed in facilitation skills.

Sources: Authors' experiences. SLP project documents, PM&E component reports.

Fact Sheet 6. Direct Observation

What is it?	Use of detailed observation of what is seen or heard on a program site of relevance to an activity. The observer does not become a participant in the activity.
What can it be used for?	• Collect information on local practices or beliefs. • Collect baseline data at the start of a program that may not be available through other sources, such as to make maps, inventory facilities. • Direct observation may gather more information than anticipated. The complexities are better understood by the observer (interviewees may not mention some facts because they assume that that they are already known). • When performance monitoring data indicate that results are not being accomplished as planned, and when implementation problems are suspected, but not understood. Direct observation can help identify whether the process is poorly implemented or required inputs are absent. • Can produce more accurate results than interviews. For instance, the interviewee may give the answer that s/he thinks is expected rather than the truth. Therefore, method is useful for triangulation purposes with other tools. • Useful tool to assess the results of training: are new skills, knowledge, and attitudes really being put into practice? • Can be used for ongoing monitoring, as of animal stocking rates or species. • Means of enforcing a behavior or activity (for instance, it is used in the treatment of tuberculosis to ensure that patients take their medicine. In addition, observers placed on fishing boats to check on the catch or verify whether child labor is being used have an obvious deterrent effect on possible wrong-doing).
What does it tell you?	This is an important tool to gather basic information and also to verify the data and opinions gathered via other means. Very useful as a means to report on behaviors, actions, and processes, for instance, a change in behavior of extension workers toward ethnic minorities as a result of a project training activity.
Key elements	• After consideration of what is important to know, direct observation recording form should be developed. It helps to standardize the process and ensure that nothing is missed. Space can be left for additional information that is not anticipated. • Consider timing. Attending at one time in the agricultural cycle might produce totally different data to another. • Select the site/s. Usually, more than one observation site is needed (selection might be random, or could be of good, average, and poorly performing sites), but this depends on the issue. • The observer must always introduce him/herself and the purpose of the activity.

	• The observer must record accurately what s/he sees or hears, trying always to be aware of her or his own biases. • The observer must be knowledgeable in the issue s/he is observing in order not to misinterpret what s/he sees. Ideally, two observers should work as a team and cross-check their observations. • The observer needs to be sensitive to local circumstances and be as inconspicuous as possible to not influence the data collected or get in the way of work. It is important that the person being observed behaves normally and does not try to alter his/her behavior. • Observation that is carried out as a one-off activity may produce less valid results than if the observer spends more time in the community to understand the context and some of the unspoken issues. However, if the subject being observed is quantifiable or involves a clearly defined behavior, the number of observations does not matter. • After data is collected, recorded an analyzed, check for potential biases and reliability.
Applicable scale	This is a very time and labor-consuming activity unless the process is very selective. It takes time to record and report on data. Depending on resources available, it should be carried out on a local level (such as on-the-job assessment of training) or on a national or even international level (such as observers on fishing boats).
Timing	In information gathering at the start of a process and for M&E purposes during and after an activity.
Data requirements	Both quantitative and qualitative data is gathered and reported.
Useful links and references	Trochim, W.M. 2001. "The Research Methods Knowledge Base." 2d ed. trochim.human.cornell.edu/kb/index.htm USAID. 1996. "Performance Monitoring and Evaluation Tips: Using Direct Observation Techniques." No. 4. pdf.dec.org/pdf_docs/pnaby208.pdf

Case Example: Direct Observation

Sustainable Forest Management Programme, Malawi (Ministry for Foreign Affairs of Finland)

Description of project

Objective: The project for Capacity Development of District Forestry Extension Staff in Social Forestry in Six Districts of the Northern Region of Malawi - Sustainable Forest Management Project (SFMP) - was initiated to improve the institutional capacity to provide effective and efficient forestry extension services to rural communities. This objective was achieved via collection and dissemination of experiences and lessons concerning social forestry, capacity building of extension staff, and improved logistics and support for forest extension at the district level.

Use of direct observation

Participatory training needs analysis. As part of SFMP, an extensive training program was established for forestry extension staff. First, a participatory cause and effect analysis was run with a broad range of stakeholders to establish the issues affecting the effectiveness of the forestry extension services. The participatory assessment tools used included focus group discussions, brainstorming exercises, problem tree analysis, semistructured interviews, problem tree analysis, and a role-play on the ownership of forestry resources.

The key issues were further analyzed to identify the training needs, which are basically, attitudes, skills, and knowledge gaps. The tools used included the needs assessment grid in which the abilities of the extension staff were assessed by using the questions (how? and why?), and the self-assessment grid in which the extension workers indicated their priority training needs. The priorities discussed and a training program were developed and budgeted.

Follow-up assessment of learning was via direct observation. For instance, a training course was delivered in computer-based mapping. Clear objectives were stated in the program and explained to the trainees.

At the end of the training, it was expected that the participants would:

1. Know how to read maps
2. Carry out all mapping requirements for VFA boundary demarcation, including collection of GPS and ancillary data, transferring GPS data to computer, process location data in mapping software, and prepare maps for printing
3. Know how to operate Mapsource and Oziexplorer baseline mapping software
4. Have the necessary knowledge of Malawi projections and mapping requirements
5. Know how to prepare baseline maps in MapInfo.

The participants were Regional Forestry Officers, District Forestry Officers, and Forestry Advisers. Within a few months of receiving the training, one of the trainers (staff member with particular expertise in mapping) would make a follow-up visit to watch the participant putting the skills and knowledge from the training course into action. With very practical skills such as computer mapping, direct observation was a good method to assess learning. Direct observation was done quite informally, and the trainer asked questions if necessary to get a good idea of the confidence of the trainee. In this situation, immediate feedback could be given on performance, and hands-on advice or reminders given. If the trainee did not carry out the tasks with sufficient proficiency, further training was recommended.

Sources: Mwalweni and Msukwa 2002, Sustainable Forest Management Programme 2003, authors and HCG staff experiences.

Fact Sheet 7. Stakeholder Analysis

What is it?	Tool to identify which people and organizations may be affected (positively or negatively) by a development activity. A stakeholder is an individual, community, organization, or group that has something to gain or lose through the outcomes of a process or project.
What can it be used for?	• Stakeholder analysis is an important step in program design, and appraisal. It also is a useful technique to use during reviews, missions, and evaluations • It is used to develop an understanding of the power relationships, influence, and interests of the various people involved in an activity. • It ensures that opinions and interests of stakeholders and their development needs can be heard during the planning of a project or development activity, as well as later in the M&E. The analysis might result in changes to the initial plan. • It enables program managers and designers to identify the interests of different groups (while recognizing that not all stakeholders will necessarily be satisfied with the activity or results). It also enables them to determine who should participate in an activity and when.
What does it tell you?	Stakeholder analysis identifies all the primary and secondary persons or organizations that may be impacted by the program, process, or activity; whether they are likely to be positively or negatively affected; and how important or influential they are in regard to the activity.
Key elements	Normally, stakeholder analysis takes place during workshops, although it can be undertaken as a desk exercise. 1. Clarify what activity or program is being analyzed and the purpose of S.A. 2. Identify all possible stakeholders or interest groups in relation to this activity and the reasons for their interest. 3. Identify the influence and importance of each stakeholder in a matrix. 4. Discuss and agree on scores for the importance and influence of each stakeholder in relation to the activity. 5. Stakeholders can then be divided according as to whether they are "High Importance and Low Influence" or "High Importance and High Influence." 6. These findings are then used by the program designers or managers in planning. They should develop a strategy for how to best engage different stakeholders in the project, how to present information to them and work with them, and how to maintain a productive relationship with them.
Applicable scale	Applicable to any scale of program or activity.
Timing	Particularly useful in program identification, design, and appraisal. Also during reviews, missions and evaluations.

Data requirements	Qualitative.
Useful links and references	• DfID. 2002. "Tools for Development: A Handbook for Those Engaged in Development Activity." Performance and Effectiveness Dept. September. • Start, D., and I. Hovland. 2004. "Tools for Policy Impact: A Handbook for Researchers, Research and Policy in Development (RAPID). ODI. www.eldis.org/cf/search/disp/docdisplay.cfm?doc=DOC16876andresource=f1

Case Example: Stakeholder Analysis

Kenya-Finland Livestock Development Programme (LDP), Kenya (Ministry for Foreign Affairs of Finland)

Description of project

Overall objective: to improve the nutritional status of the community in the program area. This was achieved by improving the productivity of dairy animals and through the realization of a more efficient performance of dairy cooperative societies. Its implementation started in 1991 and continued in several phases until June 2003. The program was implemented together with the Ministries of Agriculture and Livestock Development, and Cooperative Development.

The main aim of the program was to improve the living conditions, especially the nutritional status, of small-scale farmers and strengthen their income-generating capacity through improved dairy production and marketing. The primary target group is small-scale farmers, particularly women and cooperative society members involved in dairy activities. From the start, the LDP has focused its strategy on awareness creation, training, and motivation of farmers to improve dairy production. It also has directed its efforts to support institutions (mainly farmer based) that have evolved to render support services to dairy farming after the government withdrew from service provision. The extension approach is based on the establishment of on-farm demonstration units and models such as zero-grazing units, fodder plots, and calf pens from which farmers can learn and adopt the recommended technologies.

Use of stakeholder analysis

In 2002, after more than 11 years of program implementation, a change management process was begun. Everyone was aware that the program would end soon, and it was time to take stock of what had been achieved and plan how to continue activities without donor support in the future.

A workshop was held with the program staff and some stakeholders. The objectives were to consider the coming changes; to provide space for participants to share experiences as development practitioners, reflect on their own committees and learn from each other; and to enhance participant's appreciation of key stakeholders, strengthen networks, and provide continuous linkages. Several exercises were conducted, such as SWOT and others. A Stakeholder Analysis was carried out. The following definitions were used:

Stakeholders

- Those whose interest are the issues or those whose activities or non-activity strongly affects the issue

- Those who possess information, resources, and expertise needed to formulate strategies
- Those who control relevant information instruments.

Stakeholder analysis

- Who are your stakeholders;
- What actions are they involved in?
- What are their development strategies/approaches?
- What are their strengths, limitations, and existing opportunities (for improvement)?

Participants discussed the roles that the different stakeholders had played over the four phases of the project and expectations for the future. These roles were split on tables produced in small group work—listing each stakeholder against headings of role, activities, strategies, and limitations/gaps. The results were then compared and discussed. Participants were asked what challenges they had noted with respect to the involvement of different stakeholders. They divided the stakeholders into tables by categories (research organization, NGO, government). Strategies were discussed for how to network with different stakeholders and plans made to disseminate information to others. This information was fed into an action planning process for new activities to wind up the program appropriately and to continue work in this sector in the future.

Results of the stakeholder analysis

This was a very useful activity during the workshop as it gave participants a chance to take time out to look back at what had changed during this long period. Many of the institutional stakeholders had changed totally due to ministerial reshuffles. The whole concept of cooperatives had lost support in much of the government. Privatization had meant that many services previously provided by the government (for example, animal health services) were now being provided by private enterprises, or not at all. The impact of HIV/AIDS had also dramatically altered the landscape. The results of the analysis were fed into action plans for how to continue to support dairy farming and cooperatives in the future years.

Sources: LDP project documents, authors' and HCG staff experiences.

Fact Sheet 8. Participatory Rural Appraisal

What is it?	Planning approach focused on sharing learning between local people, both urban and rural; project staff; institutional representatives; and outsiders. It includes not only participatory methodologies or tools, but also encourages participatory attitudes and behaviors that emphasize local knowledge and enable local people to make their own appraisal, analysis, and plans.
What can it be used for?	• PRA enables development program managers and local people to assess and plan appropriate interventions collaboratively, often using visual techniques to encourage the participation of nonliterate persons (or those who do not share the majority language). • PRA encourages critical self-awareness by all participants: building learning and improvement and taking personal responsibility. • Changing behavior and attitudes: from dominating to facilitating. • PRA encourages a culture of sharing: information, methods, resources, experiences. • It makes a commitment to equity: empowering those who are marginalized, often women or ethnic minorities.
What does it tell you?	If it is done well, it can provide valuable information that would otherwise not be available for planning or monitoring. Using PRA, development activities are more likely to be relevant and to achieve the anticipated outcomes.
Key elements	The key issues are that PRA should be participatory and encourage teamwork and flexibility. It is normally carried out using a combination of interviews, workshops, fieldwork, and analyses over several days at the grassroots level. There are an enormous number of tools available. These include: • Transect walks • Participatory mapping exercises • Stakeholder analysis • Impact diagrams • Ranking methods of various types, including proportional piling, wealth ranking • Resource flow diagrams • Historical matrices • Oral testimony • Participatory video or photos • SWOT analysis • Seasonal or daily calendars, including gender differentiation • Drawing pictures.
Applicable scale	Normally carried out at local level, both rural and urban (despite the name).

Timing	Most commonly used in identification and planning stages. However, the tools also can be used in PM&E.
Data requirements	Qualitative data mainly: ideally triangulation techniques should be used to ensure accuracy and reliability.
Useful links and references	World Bank. 2004. "Monitoring and Evaluation: Some Tools, Methods and Approaches." Operations Policy Dept. Chambers, R. 2002. "Relaxed and Participatory Appraisal: Notes on Practical Approaches and Methods for Participants in PRA/PLA Related Familiarisation Workshops." IDS. www.eldis.org/cf/search/disp/docdisplay.cfm?doc=DOC10933andresource=f1 World Bank. 1996a. *The World Bank Group Participation Sourcebook.* Appendix 1. Methods and Tools. www.worldbank.org/wbi/sourcebook/sba104.htm

Case Example: Participatory Rural Appraisal

Limpopo Agricultural Development Programme, South Africa (Ministry for Foreign Affairs of Finland)

Description of project

Objective: To enhance the living conditions of low-income households in rural and peri-urban communities in Limpopo (Northern) Province, via enhanced sustainable income generating activities of smallholder farmers using integrated natural resource management techniques. The project aims to develop and strengthen the capabilities of the people/communities themselves so that they can cope with their problems and needs through District and community-based development actions and capacity building processes. The activities are defined and prioritized by local actors (people and their organizations) through a participatory planning and decision-making process. The components were (1) Integrated Rural Management Planning; (2) Integrated Rural Development (3) Institutional Strengthening.

Use of participatory rural appraisal

In 2002 PRA exercises were carried out in all the villages identified as potential project sites by the program. Program staff, consultants and Ministry of Agriculture staff from the Province organized meetings with village level participants, through liaison with the Local Chief and resident extension officers of the Department of Agriculture. Planning involved residents of the village as well as the traditional leadership of the area, and was undertaken intensively for a period of five days following a training session with the staff of the Department of Agriculture. Individual village plans were developed as a result of the PRA exercises with large and small groups.

Tools used included:

- Historical recording—What are the major events or trends that have happened in our community over 30 years?
- Participatory mapping—after a walk around and discussion, a map was drawn of the village by village representatives;
- SWOT analysis of the village;

- Who is our community and what are their livelihoods? Discussion of the main socioeconomic groups and their livelihoods. These groups were then put onto a matrix and the strengths, weaknesses, desired outcomes, threats and opportunities of each group was discussed;
- Stakeholder analysis—comparing organizations, their importance, accessibility and other comments;
- Vision for the village—an overall vision, with goals, strategies and activities was developed through group work.

The report was prepared by the consultants and fed back to the community and program. Further work was then done to develop project plans if the village had identified goals and activities that were within the framework of the program.

Results of Participatory Rural Appraisal

The PRA process was useful as it included many interest groups and allowed them to express their hopes and needs. Village plans were produced that could then be used to seek funding from various organizations, and as good basic information to use when local stakeholders worked with government bodies to try to improve services. It also produced concrete issues that the program could develop further into subprojects that could receive donor support.

Sometimes the broad nature of the PRA process meant that needs were expressed that were outside of the possibilities of the program to support. Good facilitation was needed to ensure that the villagers understood that this was an exercise to produce an overall village plan, but that LADEP would not be able to respond to all their needs in every sector. They should take action themselves to seek solutions for other problems, including calling on their own resources and strengths (as identified).

PRA also takes quite a lot of time if done well (for instance for a full week in this case). Consequently, it can be difficult in particular for busy women to participate. Women often had to drop out, at least part of the time, to look after children, cook and do agricultural work. It is important to get a balance between good planning and discussion in meetings, and getting some practical results. Some participants dropped out from the program activities (such as installing irrigation or poultry subprojects) because it was taking too long to get from the planning stage to the working project.

Sources: LADEP documents, village plans, authors' experiences.

Fact Sheet 9. Participatory M&E Methods: Community Scorecards, Community Monitoring Committees

What is it?	Process through which stakeholders at various levels: • Engage in monitoring or evaluating a particular project, program, or policy • Define purpose and scope of work, method selection, gathering and analysis of data • Share control over the content, process, and results of the M&E activity • Make decisions and engage in taking or identifying corrective actions. The focus is on the active engagement of the primary stakeholders. It is a management tool, rather than an end in itself.
What can it be used for?	PM&E has the potential to be a powerful vehicle for institutional learning-by-doing, provided that it supports two-way flows of information. These flows ensure that primary stakeholders obtain sufficient information about livelihood-enhancing opportunities available to them and that project implementers at all levels act on the feedback that they receive from primary stakeholders. Ideally, PM&E should be used for project implementation, impact evaluation, and process monitoring. It is an internal learning tool for project staff and beneficiaries, and it empowers communities. PM&E also: • Empowers stakeholders to take corrective action • Develops local community groups' capacities to demand change and better manage their own affairs • Generates ideas for projects that reflect community needs and interests, not only government interests • Improves transparency. Local groups can see how money is being spent and are empowered to demand changes if problems are seen. • Improves quality of work on infrastructure and improved service quality.
What does it tell you?	PM&E informs all levels of stakeholders of the process of the participation and satisfaction levels of the primary and secondary stakeholders, and the likely impacts. It tells both community and project staff when something is going "wrong," giving the opportunity for change. It also highlights unexpected or unplanned changes, which may not be noticed with traditional indicators and M&E systems.
Key elements	• Full range of PRA-type tools, such as mapping, impact diagrams, and resource flows • Community scorecards and ratings of service providers • User feedback forms and exit interviews • Focus groups and quick community assessments (for use during meetings)

	• Most Significant Change (story collection) • Interviews of primary stakeholders (using questionnaires), conducted by elected community representatives (monitors or evaluators), or by project staff, during or after project implementation • Improved meeting methods, including better minute-taking, listing responsibilities, voting, and ranking to prioritize project selections • Audiovisual techniques, such as before-and-after-photos or videos • Signs of well-being in the community and vision for the future.
Applicable scale	Can be used at all levels, although it is perhaps most appropriately used at the local level. It is rare that a unified system is applied across a country, although sometimes community scorecards are used for this purpose to report back to ministry level.
Timing	At all stages, including planning, implementation, and evaluation; ideally, it should be a continuous process of data collection and feedback/dissemination.
Data requirements	Data collected tends to be more qualitative and primary. Short responses can be collected and disseminated. Information flow in all directions is important. It also is possible to record quantitative data by innovatively thinking up potential answers and then recording them numerically, or by forming questions to give a yes and no answer, or a numeric rating.
Useful links and references	World Bank. 2004. "Monitoring and Evaluation: Some Tools, Methods and Approaches." Operations Policy Dept. _____. 2002. "Community-Based Monitoring and Evaluation Team. Sleeping on Our Own Mats: An Introductory Guide To Community-Based Monitoring and Evaluation." Bayer, W., and A. Waters-Bayer. 2002. "Participatory Monitoring and Evaluation (PM&E) with Pastoralists: A Review of Experiences and Annotated Bibliography." GTZ, Eschborn. Estrella, M., and J. Gaventa, "Who Counts Reality? Participatory Monitoring and Evaluation: A Literature Review." IDS Working Paper 70. Institute of Development Studies, www.worldbank.org/participation/partme.htm Waglé, S., and P. Shah. 2004. "Report Cards: A General Note on Methodology." Social Development Dept., World Bank.

Case Example: Participatory M&E Methods—Community Scorecards, Community Monitoring Committees

Sustainable Livelihoods Project, Mongolia (World Bank, JSDF)

Description of project

Objective: The Sustainable Livelihoods Programme (SLP) includes 3 components, 2 of which are subject to application of the PM&E system: the Local Initiatives Fund (LIF) and the Pastoral Risk Management (PRM) components. The LIF involves the selection in community meetings of various subprojects of construction or renovation of facilities (for example, school dormitories, health clinics), or purchase of equipment (such as motorbikes for doctors' use). The LIF then funds the implementation of the subproject and the handover to the community. The PRM component aims to strengthen the capacity of rural families, particularly herders' households, to manage risk arising from drought and *dzud* (snow disaster) that adversely affects their livelihoods. Activities are implemented under the subcomponents of risk forecasting, early warning, and response planning; pasture land management and usage; support of herder groups and cooperatives; and hay and fodder production and management.

Objectives of PM&E: (1) To support development of a Participatory Monitoring and Evaluation system for the SLP components. (2) To facilitate its effective implementation at the local and community levels to improve transparency, inclusion, and participation in the project's implementation.

Expected outcome: Current M&E system is revised and improved to support SLP components' effective implementation and integrated into community mobilization and capacity building activities.

Use of participatory M&E methods

The existing M&E system was found useful, but not sufficiently vigilant regarding the involvement of beneficiaries. The project had been implemented for a year before the PM&E work began. A range of participatory monitoring forms were developed for use at the community level, and by SLP staff at different levels. The tools are continually modified and updated in response to feedback and experiences in their use.

Tools included community's improved prioritizing of subprojects, using community-elected representatives to monitor construction projects and evaluations after completion, using interviews/questionnaires and introducing user feedback forms to project facilities; improved logbooks and self-monitoring tools for use by herder groups; and doing quick community evaluations of subprojects during meetings.

Training was provided to a wide range of community members (officials from local government as well as interested persons). Training was given in a range of PRA techniques, methods of holding meetings and encouraging participation, minute-taking, using various methods of preparing projects, prioritizing needs and projects (stepwise rankings, voting), and interviewing. Trainees were introduced to all the forms for different stages of the monitoring. Community mobilizers were recruited to stimulate the involvement of the community in planning and monitoring projects.

Normal PM&E tools tend to involve much face-to-face contact, such as meetings. In many countries, meetings can be called at short notice under a local tree, or random interviews can be conducted while walking through a village. In Mongolia, the large distances, low population densities, poor transport, and inclement weather make the organization of meetings or even interviews difficult.

There have been considerable delays and difficulties in involving the stakeholders and project staff in using the new formats and methods. These are due partly to the

difficulties in communicating: most of the project areas are not on the electrical grid and do not have email. Mobile phones are not useful out of the main centers. Not everyone can be bothered to participate.

After a very top-down governance system during the many decades of socialist government, it also is difficult for local people to understand the relevance and value of involving primary stakeholders in the work. Mongolia has no tradition of asking opinions and feeding upward any criticism from below. On the other hand, the local population is well educated, highly literate and is learning fast! Initial use of the forms has been positive, and the results are being fed back to the field.

There has been some difficulty in combining project needs for hard data (and how to record qualitative responses on the MIS), with the need to feed back information into future planning at the local level.

Sources: Authors' experiences, SLP documents, PM&E component reports, various years.

Fact Sheet 10. Most Significant Change Evaluation (MSC)

What is it?	MSC is based on telling stories about events that people think were important. It does require explaining indicators or learning special professional skills. All stakeholders can participate, and project stakeholders are involved both in deciding the sorts of change to be recorded and in analyzing the data. The significant change method sometimes is called "monitoring-without-indicators."
What can it be used for?	MSC provides data on impact and outcomes that also can be used to evaluate the performance of the program as a whole. MSC can identify unexpected changes to deliver a rich picture of what is happening, even when there are complex, diverse, or unexpected outcomes.
What does it tell you?	MSC has no predefined and agreed-by-all indicators of what constitutes important change. It is unlike monitoring with traditional preplanned indicators of the changes that are expected. The SC process is intended to be open-ended, in which the most important change possibly is discovered after the event, by the comparison of many different beneficiary/ stakeholder perspectives on all the changes that have taken place. The monitoring system is not reporting the average state of the development program, but rather attempts to capture the most significant events: the events or perceptions that are taking place on the outer perimeter of the program's experience. If the reported change is negative, then it is a type of change the program will try to avoid in the future. If it is positive, then the program will want to see that type of change become more central to and typical of its future activities as a whole.
Key elements	1. Select the domains. The program needs to define the domains (areas of interest to the program to be explored). The aim of this exercise is not to get a standard set of data but to get a range of views from various stakeholders as to the impact of the program. 2. Define the reporting period: quarterly, semiannually, or annually. 3. Decide who the participants will be: beneficiaries, project staff. 4. Phrase the question.—a visit is made to a program area and stakeholders are randomly invited to participate. The process and purpose is explained to them and then they are asked the question. The basis for recording significant changes is a simple question relating to the domain—for instance, "During the last half year, in your opinion, what do you think was the most significant change that took place *in the standard of living of the people participating in the Program?"* Then ask for each answer, *why* this was the most important. 5. The respondent's story is recorded in two parts. The first part is descriptive and includes information, such as, what

	happened, who was involved, where did it happen, when did it happen. The second part of the answer is explanatory. The respondent is asked to explain why s/he thinks that the change was the most significant out of all the changes that took place in that period, or at least very significant. In particular, what difference did it make already, or will it make in the future? 6. In many programs the next step is to collect the recorded, anonymous responses and put them through a process of community and multi-level stakeholder discussion, analysis and prioritization. This identifies a shared understanding of what the most significant changes in each domain might be—though of course it will not necessarily reflect the view of the direct beneficiary. 7. Feedback to all stakeholders (and participants) via written or verbal reports, is an important step.
Applicable scale	Most appropriate for local level programs with complex activities, however, it has been used in state or national level programs in some countries.
Timing	MSC occurs throughout the program cycle and provides information to help monitor and manage the program. The findings are useful for refocusing the activities, or removing those that cause negative change, when annual planning is undertaken. The findings tell us about the outcomes and the impact of the program.
Data requirements	Qualitative data is collected—usually short paragraphs in response to the questions. The aim is not to get a standard set of data, but rather to get a range of views from various stakeholders as to the impact of the Program.
Useful links and references	www.healthcomms.org/comms/eval/learn-eval.html Davies, R., and J. Dart. 2005. "The 'Most Significant Change' (MSC) Technique; A Guide to Its Use." www.mande.co.uk/docs/MSCGuide.pdf Dart, J.J., G. Drysdale, D. Cole, and M. Saddington. 2000. "The Most Significant Change Approach for Monitoring an Australian Extension Project." In *PLA Notes* 38, 47–53. London: International Institute for Environment and Development.

Case Example: Most Significant Change Evaluation

Thua Thien Hue Rural Development Programme (TTHRDP), Viet Nam (Ministry for Foreign Affairs of Finland)
Description of project TTHRDP is an integrated rural development program in three districts of Thua Thien Hue Province. The overall objective is enhanced pro-poor growth in Thua Thien Hue Province, and the program purpose is to increase the efficiency and poverty-impact of existing livelihood, infrastructure, and administrative systems.

The components are:

- Livelihoods Services Development (Agricultural Extension Service, Upland Irrigation, Bank Credit intermediation, Vocational and Business training, People with Disabilities)
- Infrastructure Systems Development
- Capacity Building (Public Administration Reform and Human Resources Development).

There is a strong emphasis on local democracy and decentralization, and the program is supporting the development of the capacities of many implementation organizations (agricultural extension service, banks, mass organizations).

Use of the MSC Evaluation

The MSC process was introduced during the first phase of the program to carry out more qualitative monitoring of outcomes.

The participants were (a) villagers, (b) mass organizations, (c) commune staff, (d) district staff, (e) program officers, (f) the project management team (PMT) and (g) the steering committee. The bulk of the interviews were carried out by the program's M&E officer.

The first question asked to respondents was whether they had heard of the TTHRDP. If they had not, the interview was terminated. However, it was soon realized that while villagers might not know the program by its full official name, they were familiar with it if it was called "the Finnish ODA project." Consequently, this question was changed.

Initially, the program used a set of three questions:

1. "Changes in people's living standards"
2. "Changes in people's view of the future—especially their abilities to cope with future economic and natural shocks"
3. "Any other type of change."

The program then changed to an open question: What was the most important change? Answers were encouraged in a range of topics:

1. Skills and knowledge
2. Extension service
3. Infrastructure and environment
4. Income
5. Participation
6. Other changes.

The answers were recorded and reported to village, commune, and district meetings. At each level, the community discussed and made a ranking of the most significant changes recorded as a result of TTHRDP activities. Priority changes were fed up the line, recorded in the annual report, and used to influence the next Annual Work Plan.

In the second program phase, this prioritization process was felt to mean that some of the opinions of the lower levels might be lost, because a change that is significant for farmers might not be the most significant for district meeting participants. Consequently, in the second phase, it was decided to carry out the interviews at each level but not to prioritize.

An additional change in the second phase was needed due to the scaling up of the program. There are now too many stakeholders involved for only one M&E officer to work with. The program has recruited the assistance of commune-level primary school teachers to carry out the interviews at the village level.

Sources: Programme Document TTHRDP II, Completion Report Phase I, author's personal experience.

Fact Sheet 11. Rapid Nutrition Survey

What is it?	Rapid Nutrition Survey is a sample survey of children under 5 years of age to determine the prevalence of malnutrition.
What can it be used for? What are the benefits and challenges of using this tool?	This tool is useful in assessing project impacts on particular social groups that are especially vulnerable to food insecurity, for example, in poor fishing villages or upland farming communities, in the aftermath of a natural disaster or calamity. It also is useful in establishing the indirect nutritional effects of project interventions on the household, with particular focus on children under 5 years. The standard means of assessing malnutrition is to measure children's height and weight and compare them among themselves and to average heights and weights of children of the same age in a comparable group of reference (for example, the country as a whole). (IUCN, Participatory Health Appraisal) The application of this tool at key stages of project implementation will provide a quantitative measure over time of the extent of malnutrition among the under-5 children in a community. As it is based on sampling of children in a particular community (see IFAD Handbook), the usefulness of the tool will be influenced by the representativeness of the samples of children measured. Cost also is a factor; undertaking a nutrition survey requires measuring equipment (scale, tape measures), skilled staff, and logistics. In some developing societies, there also are cultural barriers that hinder mothers from allowing their children's physical measurements to be taken.
What does it tell you?	The three key indicators of nutritional status based on anthropometry, or physical measurements of height and weight by age of children, are: • *Chronic malnutrition* (also called "stunting") is a measure of height relative to age. It is perhaps the most relevant indicator for the overall well-being of a community. High levels of chronic malnutrition reflect deprivation over a period of months or years. Children who are chronically malnourished may suffer irreversible disability in mental and physical development, causing poor performance in school and reduced physical productivity for the rest of their lives. • *Acute malnutrition* ("wasting") is a measure of weight relative to height. It is associated with temporary shocks, such as famine or episodes of illness. • *Underweight* is a measure of weight relative to age. It most often is used to monitor the nutrition status of individual children. These anthropometric indicators are gender sensitive and appropriate in multicultural contexts. (IFAD)
Key elements	Age, weight, and height measurements of children under 5.
Applicable scale	Local (households, communities).

Timing	Baseline survey; repeat surveys at project mid-term and completion. Changes in the level of malnutrition can be measured at intervals of 3 years for 6-year projects and of 5 years for 10-year projects. (IFAD, Rapid Nutrition Surveys for Estimating Project Impact)
Data requirements	Quantitative information: age (in months), gender, height (cm) and weight (kg)
Useful links	www.ifad.org/hfs/tools/hfs/nutrition.htm www.ifad.org/hfs/tools/hfs/anthropometry/ant2_toc.htm www.iucn.org/themes/spg/Files/opor/opor4_3.html
References	IFAD. N.d. (a) Rapid Nutrition Surveys for Estimating Project Impact. IFAD. N.d. (b). Training Handbooks. Practical Anthropometry 101 Tools for Preparing a Survey. Practical Anthropometry 102: Collecting Anthropometric Measures of Children. IUCN. 1997. Participatory Health Appraisal.

Case Example: Rapid Nutrition Survey

Please refer to www.ifad.org/events/past/impact/presentation/nutrition.htm *for a number of useful case examples of using rapid nutrition surveys for estimating project impact.*

Fact Sheet 12. Seasonal Food Availability Analysis

What is it?	Seasonal food availability analysis is a participatory method for assessing local-level food security risks and malnutrition among children.
What can it be used for? What are the benefits and challenges of using this tool?	As an alternative to rapid nutrition surveys, an analysis of seasonal food availability can point out risks to food security at household and community levels and indications of malnutrition among children. It involves a participatory survey of villagers or members of a community on incidences of food availability/scarcity, and brief, structured interviews of mothers regarding risks to their children's health and nutrition. This method is useful for drawing insights of affected groups as to whether project activities or interventions have led to the scaling up or mitigation of risk factors or conditions with respect to food security in the household or the community. This method is less resource intensive than rapid nutrition surveys as it involves only participatory sessions with villagers and facilitated discussions with mothers. At the minimum, the application of this method will require capacity in preparing relevant tools and questions for the participatory sessions and the services of a facilitator.
What does it tell you?	This method provides an approximate measure of food security risks and local malnutrition. The analysis of seasonal food availability involves using sticks of varying lengths for each month of the year. Program staff together with a group of villagers place 12 small stones in a line, each separated by a few centimeters. Having at their disposal sticks that can be broken off for varying lengths, villagers select a long stick and place it close to the month that has the greatest food availability. Then, they place progressively smaller sticks close to months that have less food availability. Typically, the "leanest" month will be just prior to harvest of the new crop. The result is a histogram that visually represents the good and the bad months. Using this diagram as a basis for discussion, a facilitator can elicit from the participants implications of this seasonal variation for child health and nutrition, the gathering of edible plants in the fields and forests, the spread of infectious diseases, and household coping strategies. This informal discussion can prepare for more detailed interviews involving all (or a sample of) mothers with children under age 10. The questions should be few and sufficiently straightforward. Sample questions could include: • Did any of your children go to bed hungry over the past year, and, if so, which months were the hardest? • How many of your children had diarrhea in the past month? • Did you take all of your children for immunizations at the government clinic/during the immunization drive? • How do you manage when food supplies run low (for example, gather food in forest, borrow money/food, take on new jobs)? (IUCN, Participatory Health Appraisal)

Key elements	Participatory sessions with villagers. Interviews and facilitated discussions with mothers.
Applicable scale	Local (households, communities).
Timing	At baseline, project mid-term and project completion.
Data requirements	Quantitative information: age (months), gender, height (cm) and weight (kg).
Useful links and references	IUCN. Participatory Health Appraisal. www.iucn.org/themes/spg/Files/opor/opor4_3.html

Case Example: Seasonal Food Availability Analysis

Namibia-Finland Forestry Programme (NFFP) Phases I, Namibia (Ministry for Foreign Affairs of Finland)

Description of project

The NFFP Phase I ran from 1997–2001 and supported components of institutional strengthening, forest fire management, forest inventory, and participatory forest management.

Use of Seasonal Food Availability Analysis

As part of the planning and monitoring of the Community Integrated Forest Management Plans and the Forest Fire Management component, seasonal food availability was analyzed. The expectation was that an integrated model combining three of the most important natural resources in the villages—agroforestry (including the whole cropping system), livestock, and forestry—needed considerable inputs on community problems, needs, and possibilities.

In group work, community members were asked what foods they used during the year, including forest products. A table of the months of the year was created, and key times were marked on it (for example, expected rains, fire risk periods, harvest of crops, and harvest times of forest products). The discussion of food availability was used to add information to the table. Livestock carrying capacity of the village grazing lands also was discussed.

This table was revisited during monitoring visits to the community by forest department and program staff to check whether food availability had changed as a result of project activities.

Results of Analysis

For instance, forest and veld fire management was a component of the program. Fires have a big impact on the local environment. Depending on their timing and intensity, they may be a means of increasing fresh grass for cattle grazing and thereby increasing carrying capacity and food availability. However, if too intense, they may destroy mushrooms, berries, and trees. The NFFP calculated the financial benefits for farmers of reduced wild fires and improved fire management. Food scarcity periods clearly decreased due to increased availability of milk and meat, as well as forest and veld products such as berries, mushrooms, herbs and other plants. The analytical tool clearly was useful for demonstrating to farmers as well as to other stakeholders the changes since the start of the program activities.

Sources: Program documents, authors' and HCG staff experiences, White and Mustalahti 2005, Jurvelius and Kawana 1998.

Fact Sheet 13. Social Impact Assessment (SIA)

What is it?	SIA is a methodology to assess any "significant improvement or deterioration in people's well-being or any significant change in an aspect of community concern." (Barrow 2000) SIA aims to assess the qualitative effects on people and their relationships; determine issues of concern; improve communication, understanding, and involvement; and ensure environmental justice.
What can it be used for? What are the benefits and challenges of using this tool?	SIA is widely applied in feasibility and planning studies. Apart from its predictive applications, SIA also is useful during project implementation for ongoing monitoring of project outcomes and impacts on affected social groups. If used consistently throughout the project cycle, SIA provides "a better assessment approach . . . to link pre-development assessment, impact assessment during implementation and ongoing monitoring." (Barrow 2000) The WB requires social analysis to be carried out during project preparation. The social analysis focuses on the opportunities and constraints; and the likely outcomes, impacts, and risks of a project. SA asks whether its social benefits and outcomes have been made clear and then determines whether the opportunities offered by the investment outweigh the social costs. SA also assesses alternatives to the project and provides inputs to feasibility studies and design. (WB 2003b) The WB also requires the borrower to undertake a social assessment in conjunction with project preparation. The assessment uses a mix of qualitative and quantitative tools to determine the likely social impacts of a project on stakeholders and the likely effect of stakeholders on the project. The social assessment is viewed as participatory research during project preparation, and as an ongoing process to enable involvement of beneficiaries and affected persons during implementation. (WB 2003b)
What does it tell you?	The key questions to ask in undertaking a SIA for M&E may include: • What are the effects of the development on the existing settlement? • What has happened to local incomes? • What are the employment impacts? • What has happened to human resources availability? • What are the effects on material resources? • What has happened to the provision of services (healthcare, education, welfare provision)? • What has happened to community cohesion? • What has happened to local administration and decision-making? (Adapted from Barrow 2000)

Key elements	Participation of affected social groups in generating and analyzing information. Qualitative indicators of social processes and impacts.
Applicable scale	Applicable at subnational/regional level assessments but more widely used for local-level (households, communities) assessments.
Timing	For M&E purposes, it would be useful to undertake a follow-up SIA at project mid-term and at completion. The preproject social assessments could serve as the baseline.
Data requirements	Mostly qualitative information. Primary and secondary data.
Useful links	www.worldbank.org/socialanalysissourcebook/
References	Barrow, C.J. 2000. *Social Impact Assessment: An Introduction*. Finsterbusch, K., J. Ingersoll, and L. Llewellyn, eds. 1990. *Methods for Social Analysis in Developing Countries.* World Bank. 2003b. "Social Analysis Sourcebook." World Bank. 2003a. A User's Guide to Poverty and Social Impact Analysis. European Commission. 1997. Forest in Sustainable Development. Vol. II. Tools for Project Cycle Management, Part E-I.

Case Example: Social Impact Assessment (SIA)

Thua Thien Hue Rural Development Programme (TTHRDP), Viet Nam (Ministry for Foreign Affairs of Finland)

Description of project

The first phase of TTHRDP (1999–2003) was an integrated rural development program in Phong Dien district of Thua Thien Hue Province. The objectives of the program were to raise rural incomes and empower local communities. These objectives were to be achieved through conducting activities in four components: institutional development, rural income expansion, infrastructure development, and environment protection. There was a focus on using participatory approaches.

Use of SIA

Toward the end of the first phase, an impact evaluation was carried out, focusing on the rural infrastructure that had been planned and constructed by the program. This included SIA aspects.

Conceptual considerations included:

- To consider information related to planning processes; types of infrastructure works executed; investment ownership; potential (multidimensional) contribution to poverty reduction (if any) of each type of infrastructure work; commune level differences in terrain, modality of income earning (farm, nonfarm, mixed), rural/urban characteristics, flood prone areas, and prevalence of poverty.
- Concept of poverty in Vietnam: causes, contributing factors, dimensions.
- Impact on poverty: quantitative and qualitative aspects; gender aspects; planning process; type of infrastructure work.

Limitations

It was felt that focus groups and community interviews would not be so useful due to the language barriers and concerns that some participants would not speak up regarding sensitive issues in a group meeting, as well as the local evaluators' lack of experience with these methods. There also was inadequate baseline information for a good comparison.

Research instruments developed and used

Household Questionnaire, Commune-level Questionnaire, and District-level Questionnaire were used.

Gender-balanced interview teams of two persons were used to conduct the household interviews. They were usually local teachers and students and were given interview training at the start. After fieldwork, the interview team—assisted by the consultants—recorded the results on summary sheets. The consistency and reliability of the information was double-checked with the interviewers.

Recommendations developed from this assessment were fed back to the program for consideration. As a result, changes were made to procedures and guidelines for future infrastructure development.

For instance, the design of the Local Planning Process was modified to ensure that it was representative of villagers' preferences (although the SIA also demonstrated that the LPP had been quite responsive). The potential negative impact on very poor beneficiaries of requiring a set local investment contribution to infrastructure works construction was noted. As a result, the guidelines were changed, and negative impacts minimized via reducing the obligatory contribution for high-cost works such as electricity works and paying more attention to the design to avoid either temporary or longer-term indebtedness of the households (such as water supply to central points in villages rather than to households).

Results of SIA

It also was found that, overwhelmingly, respondents indicated that their first priority was a (village) road, followed at some distance by improved and expanded irrigation systems. There was fairly unanimous selection of priorities between poor and nonpoor, or male and female respondents. This was an interesting finding for the program staff, who had expected that women would place a higher priority on other infrastructure, such as schools or kindergarten construction.

Sources: Program documents, experiences of authors and HCG staff, Bertens 2003, Consultancy on Economic and Social Impact of Rural Infrastructure Works in Phong Dien District, Final Report. Thua Thien Hue Rural Development Programme.

Fact Sheet 14. Gender Analysis

What is it?	Gender analysis is a structured approach to understanding and documenting the differences in gender roles, activities, needs, and opportunities in a given context. It disaggregates quantitative data by gender. It highlights the different roles and learned behavior of men and women based on gender attributes. These vary across cultures, class, ethnicity, income, education, and time. Gender analysis does not treat women as a homogeneous group nor gender attributes as immutable. (*The WB Participation Sourcebook*)
What can it be used for? What are the benefits and challenges of using this tool?	Gender analysis examines women's roles in production, reproduction, and management of community and other activities. Changes in one may produce beneficial or detrimental effects in others. Gender analysis (1) identifies gender-based differences in access to resources to predict how different members of households, groups, and societies will participate in and be affected by planned development interventions, (2) enables planners to achieve the goals of effectiveness, efficiency, equity, and empowerment through designing policy reforms and supportive program strategies, and (3) enables the development of training packages to sensitize development staff to gender issues and training strategies for beneficiaries. (*The WB Participation Sourcebook*) Comprehensive gender studies are applied primarily in policy development and program/project planning. However, aspects of gender analysis may be applied in monitoring and evaluation—that is, for intermittent monitoring of gender implications of project activities/outcomes. Simple techniques useful for this purpose include direct observation, focus groups, and time-use studies (for example, typical daily routine of women including house work, income generation, and personal time). If carried out consistently as part of project M&E, gender analysis will help build a picture of women's growth as individuals and social beings, that is, their standing in the household and in the community. Gender considerations in benefit include (1) developing indicators that define and measure progress in achieving benefits for men and women; (2) ensuring sex-disaggregated data are collected to monitor gender impact; and (3) considering involving women in M&E activities. (ADB Gender Checklist for Agriculture)
What does it tell you?	• Practical gender needs – women's traditional gender roles and responsibilities. • Strategic gender needs – issues of equity and empowerment of women, such as access of women, as a group compared with men, to resources and benefits, including laws and policies (such as owning property). • Intrahousehold dynamics – interdependent relationships, the rights, responsibilities, obligations, and patterns of interaction among household members – men, women, and children—that affect priorities, access, and control over resources.

	• Interhousehold relations - gender differences in roles, functions, and access within the social organization of larger networks such as professional or religious groups or extended families. (*The WB Participation Sourcebook*)
Key elements	Five major categories of information are required for a comprehensive gender analysis are (1) needs assessment; (2) activities profile; (3) resources, access, and control profile; (4) benefits and incentives analysis; and (v) institutional constraints and opportunities. (*The WB Participation Sourcebook*) In more practical terms, gender analysis involves (1) activity profiling (who does what?)—what men and women (adults, children, elders) do, and where and when these activities take place; and (2) access and control profiling (who has what?)—who has access to and control of resources and services, and decision-making. (ADB Gender Checklist)
Applicable scale	Can be carried at national or local levels.
Timing	Comprehensive studies at baseline and end-of-project; intermittent monitoring of gender implications of project activities/outcomes using basic techniques (focus groups, time-use studies).
Data requirements	Mostly qualitative, supplemented by secondary or primary quantitative data
Useful links	*The World Bank Participation Sourcebook*, 1996a. www.worldbank.org/wbi/sourcebook/sbxg03.htm World Bank GenderNet
References	ADB. 2001. Gender Checklist for Agriculture. Mikkelsen, B. 1995. Methods for Development Work and Research: A Guide for Practitioners. World Bank. 2005c. Gender Issues in Monitoring and Evaluation in Rural Development: A Toolkit. World Bank. 1996a. *The World Bank Participation Sourcebook.* www.worldbank.org/wbi/sourcebook/sbhome.htm

Case Example: Gender Analysis

Rural Water Supply and Sanitation Support Programme, Phase III—Nepal (Ministry for Foreign Affairs of Finland)

Description of the project

The RWSSSP was the third phase of support to rural water supply and sanitation in this region and ran from 1999–2004. The first phase had run 1990–1995, and the second phase from 1996–1999. The overall objective of phase III was to contribute to full coverage (later changed to 85 percent based on the National Guidelines) of adequate and sustainable water supply and sanitation facilities and services in the area. This increment was to be achieved via:

1. Improving the institutional capacity of the districts to enable decentralization from the national level to the districts, and from district to users for implementation and sustainable management of RWSS

2. Provision of financial support for implementation
3. Improvement of methods in implementing and operating and maintaining water supply and sanitation facilities.

During the 5 years of the program, water supply services were provided to a total of 203,000 people and sanitation to 264,000 people.

Use of Gender Analysis

As part of the program late in Phase II, an Integrated Gender Plan was developed from the results of the Gender Analysis. The analysis was done to assess whether the impact of selected Phase I components would clarify whether gender issues were adequately considered in Phase II, and to assist in the preparation of the Gender Plan. Specific information was sought on the impacts of changes in dissemination of information about the program, participation in project planning, and participation in project implementation and supervision. The analysis particularly concerned additional involvement of women and marginalized ethnic groups. The main impacts examined were those concerning the household and community economy, health, and the sustainability of adequate, equitably distributed water supply.

The gender analysis was carried out in a representative selection of districts and wards, in villages in which project activities had been implemented 2–3 years earlier. Enumerators were selected, trained, and sent out to use questionnaires for the interviews of men and women at the household level. Additional persons also were interviewed (such as teachers, traditional healers, water user committee members). Some questions were open ended, and others had a possible selection of answers. Problem cases at the local level were highlighted; a picture of the village and their economies was obtained; a needs assessment was done; and an integrated knowledge, attitudes, and practices analysis (KAP) was implemented.

Results

- The results were analyzed and discussed with communities. As a product of the analysis, an integrated gender plan was prepared. It focused on changes in the approach and implementation that might better promote a gender balance and ensure that women and ethnic minorities can benefit from the program.
- Gender issues were incorporated as a cross-cutting theme in practically all human resource development activities; the monitoring system was made gender and ethnicity/caste sensitive; and a good gender balance was advocated at all levels. The Program Support Unit carried out a Gender Audit as well as gender-focused activities.
- All data collected for planning, implementation, or monitoring purposes was disaggregated to show gender and caste or ethnicity.
- A 2000 gender workshop updated staff knowledge to ensure that they gave continued attention to gender in monitoring Phase III. The gender indicators were updated and used both for baseline and monitoring data collection within the MIS.
- Difficulties occurred with the ongoing collection of gender-specific data and with all monitoring data—due mainly to lack of time, insufficient follow-up, and lack of understanding by local staff of the importance of monitoring. In addition, the focus of the day-to-day monitoring was implementation of the engineering works, and gender monitoring was given insufficient attention by staff. It was felt that the information from the original gender analysis had been very useful, so the team developed follow-up case studies (small-scale gender analyses) of gender impacts.

Sources: Program documents and information from HCG staff.

Fact Sheet 15. Institutional Analysis

What is it?	Institutional analysis uses qualitative methods to understand the institutional framework for any given development context that includes both public and private organizations as well as informal groups and their individual capacities and competencies; the "rules of the game" embodied in legislation and regulatory/administrative systems and in structures of power and influence; and interinstitutional relationships.
What can it be used for? What are the benefits and challenges of using this tool?	More widely used for policy design and program/project planning, institutional analysis enables an understanding of the political economy and governance issues through analyzing the institutions, identifying their dynamic processes and potential constraints. Steps include (1) identifying the government agencies, NGOs, and firms that will carry out the policy reform and (2) identifying their characteristics and dynamic relationships. The output is an understanding both the "rules of the game" and the informal rules that govern actual behavior in decision-making processes. (WB PSIA) Applied in an M&E context, institutional analysis is useful in assessing whether the project is effectively addressing capacity or structural limitations of those agencies (public and private, formal and informal) involved in project implementation. It also identifies (and therefore can help remedy) organizational limitations in fostering greater participation by disadvantaged groups (women, ethnic and indigenous people). Another practical application of institutional analysis is in understanding the dynamics and influence of existing local or grassroots organizations and social networks, and how the project is effectively tapping into them. Institutional assessment is captured in other tools/methods including: • Analysis of strengths, weaknesses, opportunities, and threats (SWOT)—useful for qualitatively assessing the services provided by the project, relationships among project stakeholders, and the organizations of the implementing partners and local groups • Stakeholder Analysis (Fact Sheet 7) • Social Impact Analysis (Fact Sheet 13).
What does it tell you?	For M&E purposes, institutional analysis can be adapted to assess project outcomes of: • Organizational restructuring and capacity building of public sector agencies and consequences on overall performance (for example, services delivery, organizational culture) • Capacity building at the local level, particularly participation of targeted users/ beneficiaries in planning and implementing project activities • Collective actions/initiatives of local or grassroots organizations • Tapping into existing social networks to support project implementation or to enhance greater distribution of project benefits.

Key elements	Three types of information: (1) background on key stakeholders and organizational structures of relevant agencies; (2) in-depth interviews or focus groups with key informants from government agencies, NGOs, and firms; (3) triangulation and cross-referencing with other information to validate background information and key informant interviews. (WB PSIA)
Applicable scale	Mostly carried out at national or subnational for policy and planning applications. For M&E, usually more applicable at local level.
Timing	Comprehensive study at project preparation could serve as baseline. For intermittent monitoring, can be carried out using simple techniques such as focus groups, community group interviews.
Data requirements	Mostly qualitative.
Useful links	
References	IFAD. 2002. "Managing for Impact of Rural Development: A Guide for Project M&E." Mikkelsen, B. 1995. "Methods for Development Work and Research: A Guide for Practitioners." World Bank. 2003a. "A User's Guide to Poverty and Social Impact Analysis."

Case Example: Institutional Analysis

Third Livestock Development Project (TLDP), Nepal (Asian Development Bank)

Description of project

The overall goal of the project was to reduce poverty in rural areas by improving the nutrition, income, and employment opportunities for farmers and resource-poor rural people, especially women, through increased productivity of their livestock in a manner that is ecologically sustainable and socially equitable. The specific objectives of TLDP were to (1) improve the productivity of livestock; (2) develop alternative market outlets for livestock and livestock products, including milk, meat, eggs, fiber, and live animals; (3) develop the institutional capacity of Department of Livestock Services (DLS) in social as well as technical spheres to facilitate self-sustainable growth in the livestock subsector and expand DLS' capacity to coordinate, manage, and monitor the execution of the proposed project; and (4) establish livestock farmer groups and develop their capacity to plan, manage, monitor, and evaluate their own development processes to become self-reliant.

Use of Institutional Analysis

Institutional strengthening was an important component of TLDP. The starting point was to identify (through stakeholder analysis and attributing roles) and determine the key roles (through various institutional assessments) of the principal institutions involved in the sector. The institutions included governing departments concerned with agriculture, livestock, and rural affairs (primarily the Department of Livestock Services, DLS; the Department of Forestry, and Ministry of Local Development); parastatal agencies involved in environmental activities; NGOS and local community organizations (administrative, political, and social). The project then worked with these stakeholders to improve capabilities and capacities in the belief that, unless all

stakeholders are assisted, the same path of project implementation will be constrained by the poorest performer. The project's main thrust was to change attitudes (ways of doing things) as well as capabilities (the methods for doing things) by adopting participatory processes. This objective was based on the view that effective association and development among all livestock development stakeholders are essential and cumulative processes that require continuous participatory dialogue over an extended time. To change attitudes, stakeholders need new tools. Staff were trained in PRA (so they could talk to NGOs), in processing and marketing (so they could talk to the private sector), and in gender and environment (so they became sensitized to these issues). With new abilities came experimentation, new behaviors, and new attitudes.

Results

The project was designed around a participatory process-oriented approach that was intended to enable experiential and organizational learning, risk assessment, and flexibility in implementation. The focus was on the involvement of the beneficiaries and other stakeholders in a "bottom-up" planning and development process based on the needs and wishes of the beneficiaries. The approach has moved the DLS along the path from being technical instructors to being development facilitators, from managing subsector development in isolation to being a collaborative, partnership-oriented department. Bottom-up is fine but it has to meet top-down somewhere; managing that interface was critical.

The support for capacity building within existing institutions generally helped to improve service delivery. However, the more important achievement was the reorientation of staff away from the standard top-down and technically based, production-oriented services to more inclusive and community-oriented services and market-chain-oriented (a more holistic approach). DLS district staff in the project area now undertake their duties and responsibilities differently, that is, they are generally more inclusive and participatory in their dealings with others. Staff are given the opportunity and responsibility to brief visitors and participate in discussions that were not apparent in the earlier top-down driven approach. The inclusion of farmers and other agency representatives is now much more common in planning and implementing DLS programs.

The project's approach to farmer group development (for example, through the establishment of enterprise-focused farmer groups) has become a widely adopted development approach in Nepal. It has improved the basis on which groups are formed, strengthened, made more representative, and assisted to become viable in the long term; and introduced the concept of organizational "growth."

By encouraging the creation and support of livestock industry-related associations (LIRAs) in several districts, TLDP has led the way in further empowering livestock keepers and entrepreneurs. Individual farmer groups may increase their capabilities and become LIRA by becoming cooperatives or trading associations. Several farmer groups may form LIRA to manage the "larger" issues that evolve out of successful production-oriented activities (for example, processing, marketing, and lobbying).

The DLS also was the first government department to mobilize local community-based organizations (CBOs)/NGOs on a partnership basis for the implementation of project activities, the first to improve the capacity of partner NGOs to become microfinance institutions delivering credit to the farmer's door and the first to commission the private sector to be service providers (training) and investors. This partnership approach has been now institutionalized in the DLS.

Source: ANZDEC Ltd. 2004.

Fact Sheet 16. Environmental Assessment (EA)/Environmental Impact Assessment (EIA)

What is it?	EA is a process of the pre-implementation stage whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project (Category A–C). The purpose of the EA is to minimize negative environmental impacts of a project. In WB's environmental policy, EA is mandatory for projects, which may potentially have negative impacts. In addition, legislation of most client countries requires similar EIA procedures, which should be reviewed and approved by the authorities. There also are procedures for transboundary EIA. Well-organized public participation is mandatory in all the stages of the process. The borrower is responsible for carrying out the EA with the assistance of the WB, both also reviewing its findings and recommendations.
What can it be used for? What are the benefits and challenges of using this tool?	The EA/EIA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. In the M&E, the quality and due implementation of the EA/EIA should be evaluated. Special attention should be paid for the views of local population affected.
What does it tell you?	EA/EIA takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property), transboundary and global environmental aspects; and national environmental action plans; the country's overall policy framework, national legislation, and institutional capabilities. In the M&E, the EIA monitoring reports reveal the efficiency of environmental mitigation measures.
Key elements	Depending on the project, a range of instruments (methods described in several guidelines) can be used to satisfy the Bank's EA requirement: • Environmental Impact Assessment (EIA) • Regional or Sectoral EA (for strategy, policy, plan, or program, or with a series of projects for a particular region) • Environmental Audit • Hazard or Risk Assessment (probability of harm occurring from the presence of dangerous conditions or materials) • Environmental Management Plan (EMP).
Applicable scale	The scale depends on the magnitude of the project and its potential environmental impacts. The EA/EIA guidelines define the categories and procedures required for each of these.
Timing	The EA is initiated as early as possible in project processing and is integrated closely with the economic, financial, institutional, social, and technical analyses of a proposed project. The EA/EIA

	process continues through the time of the project and also can include, for example, post-project monitoring responsibilities.
Data requirements	During project implementation, the borrower reports on the (a) compliance with measures agreed with the Bank based on the findings and results of the EA, including implementation of any EMP, as set out in the project documents; (b) status of mitigatory measures; and (c) findings of monitoring programs. The Bank bases supervision of the project's environmental aspects on the findings and recommendations of the EA/EIA. The data requirements have been defined in the EA/EIA guidelines; public consultation also is mandatory.
Useful links	www.iaia.org/eialist.html www.art.man.ac.uk/eia/EIAC.htm http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/
References	World Bank. Environmental Assessment. Operational Manual 4.01. World Bank Group. Safeguard Policies (http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/) World Bank Group and others. 1998. *Pollution Prevention and Abatement Handbook: Toward Cleaner Production*.

Case Example: Environmental Assessment (EA)

Irtysh Pine Forest Protection and Reforestation Project in Kazakhstan (World Bank)

Description of project

The project includes rehabilitation and effective management of 650,000 ha of damaged Irtysh pine forest in the northeast Kazakhstan, including replanting some 41,000 ha. Large forest areas have been destroyed by wildfires over the last 10 years (127,000 ha) and by pests and illegal cuttings.

The EA analyzed the environmental situation, potential impacts of the project, and possible alternative solutions; and defined requirements for EMP, institutional capacity building, and monitoring. The study also assessed the appropriateness of the traditional methods used in forest management in the area. The EA stated that the evenly distributed forest cover to the burned areas can be achieved only by using tree planting. This method makes it possible to reforest areas covered by grass and to use different tree species in appropriate soil types. Most of the forest fire areas are so extensive and trees completely burned that natural regeneration does not happen. Where possible, natural regeneration should be preferred.

Some pests may cause damage to seedlings in nurseries; therefore, pesticides are used. Chemicals are used for soil fumigation, pathogenic fungi, and seed treatment; and against root and foliage diseases. The EA stated that the use of pesticides in preparing planting stock should be according to international standards for handling such chemicals.

Intact Irtysh pine forests with densely growing trees are vulnerable to mass occurrence of, for example, Tenthredinidae and Neodiprion sertifer pests, which may cause major damage to trees. The EA/EMP team made a tentative Pest Management Plan based on integrated pest management (IPM) principles to be further developed in the project.

The Irtysh pine forest is located close to the former test range of nuclear weapons. The risks associated with the nuclear contamination were assessed in the EA based on existing data.

In burned areas, remaining dead trees have been removed by doing salvage harvesting, and other debris has been heaped by bulldozers. In the past, this debris was burned, but now it is left in windrows. Traditionally, the seedlings are planted using a tractor and specific plowing and planting machinery. The project considered the practice of completely cleaning the burned areas ecologically unsustainable and unnecessary, and the planned use of machinery is destructive to soils and energy inefficient. Preferably, local people could carry out the work with hand-tools to maximize the socioeconomic benefits of the project. Local population also expressed the importance of the surrounding forests for its livelihood as a source of timber, fuelwood, berries, mushrooms, and game.

Role of EA in M&E

The EA was done simultaneously with planning the technical components. The EA team included the international team leader and 7 local experts (biologist, geographer, pest expert, and 4 radionuclide experts). The project also prepared an EMP. The two documents together provide strategies and methods for due environmental consideration.

In connection with the M&E missions, the due implementation of the EA and EMP should be checked. The documents gave certain responsibilities to the governmental authorities, Project Implementation Unit, and contractors implementing the project. The M&E work may start by interviewing local project experts and the institutions responsible for the environmental management. Other local experts, NGOs, and population affected also should be interviewed to find out the real impacts of the project in the field. In a case of emerging environmental problems, additional conditions can be given to the stakeholders.

Source: HCG Ltd.

Fact Sheet 17. Environmental Management Plan (EMP)

What is it?	A project's Environmental Management Plan (EMP) is a practical tool that steers the project's works and operation for due environmental consideration and Best Practices. Usually, it is an appendix to major work contracts, and its application is mandatory. It consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The EMP is an essential element of Environmental Assessment reports for Category A projects; for many Category B projects, the Environmental Assessment may result in an EMP only. The EMP is an instrument to implement the requirements of the EA report approved before project implementation begins.
What can it be used for? What are the benefits and challenges of using this tool?	The borrower and its EA design team (a) identify the set of responses to potentially adverse impacts; (b) determine requirements to ensure that these responses are made effectively and in a timely manner; and (c) describe the means for meeting these requirements. The EMP focuses on cost-effective measures to remediate and manage these problems. The EMP can be seen as practical environmental guidelines for project implementation. The M&E should evaluate how efficiently these guidelines have been implemented by the relevant project staff, contractors, and authorities.
What does it tell you?	In M&E, the assessment of the EMP implementation will tell how well environment is taken into account in the activities, and the plan's monitoring results will reveal whether the project's actual environmental effects are at an acceptable level. The EMP identifies feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels. The plan includes compensatory measures if mitigation measures are not feasible, cost-effective, or sufficient. Specifically, the EMP 1. Identifies and summarizes all anticipated significant adverse environmental impacts (including those involving indigenous peoples or involuntary resettlement) 2. Describes—with technical details—each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (for example, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate 3. Estimates any potential environmental impacts of these measures 4. Provides linkage with any other mitigation plan (for example, involuntary resettlement, indigenous peoples, or cultural property) required for the project. Environmental monitoring of the EMP during project implementation provides information about the environmental

	impacts of the project and the effectiveness of mitigation measures. Such information enables the borrower and the WB to evaluate the success of mitigation as part of project supervision, and enables corrective action to be taken when needed. Therefore, the EMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the Environmental Assessment report and the mitigation measures described in the EMP. Specifically, the monitoring section of the EMP provides: (1) A specific description of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions (2) Monitoring and reporting procedures to (a) ensure early detection of conditions that necessitate particular mitigation measures and (b) furnish information on the progress and results of mitigation.
Key elements	The M&E should assess (1) is the existing EMP implemented from all its parts? (2) have the Best Practices been applied? (3) have unexpected environmental problems emerged? (4) are additional actions required to achieve acceptable levels of environmental protection?
Applicable scale	The EMP usually is prepared before project implementation but can be requested to be compiled later. In the M&E, EMP implementation should be assessed. Applicable in all projects for which EMPs have been prepared during the planning stage.
Timing	For M&E purposes, it would be useful to undertake a follow-up assessment at project mid-term and at completion. In major projects, the assessment soon after the commencement would be beneficial to check that all the requirements for the EMP implementation are being met.
Data requirements	Environmental Assessment, Environmental Management Plan, reports of EMP implementation unit, reports of environmental authorities, and possible complaints over the project impacts.
Useful links	web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/
References	World Bank Group. Safeguard Policies (web pages).

Case Example: Environmental Management Plan (EMP)

Dry Aral Seabed – Forest Protection and Reforestation Project in Kazakhstan (World Bank)

Description of project

The excessive use of water resources in the Aral Sea watershed has resulted in a rapid lowering of the lake surface. The project areas are located in the exposed seabed of the Aral Sea. Moreover, dust storms can transport dust over very long distances and carry salt particulates and some pesticide residues to populated areas. Thus, the

coastal zone up to 100 kilometers wide is mostly not covered with vegetation. However, adjacent saxaul and tamarix woodlands are slowly spreading to this area.

The project includes vegetative planting of 79,000 ha on the dry Aral seabed including all facilities and equipment, nursery techniques, and new management approaches. The purpose is to reduce erosion and dust storms and also to produce needed fuelwood for local population and fodder for cattle.

The project environmental team first conducted an EA, studied soils, fauna and flora, and activities of the population. The team found out that the preparation of an EMP is necessary because the project has a number of works that require special attention to protect the environment. For example, earlier, the project workers had driven 4-wheel trucks everywhere, damaging the fragile vegetation cover, which accentuated erosion. The EMP requested the project experts to prepare a plan for regular roads and ban off-road traffic. In addition, there are several unique habitats with several rare species of fauna and flora. The EMP requested a mapping of such sites so that they can be left untouched.

The soils of the area differ from place to place mostly in salinity. Therefore, the EMP proposed a map be compiled showing sites for most suitable tree species to be planted.

The seedlings were planted earlier using a tractor and specific plowing and planting machinery. The machinery digs shallow furrows approximately 1.5 m wide in which the saplings are set. The EMP recognized that this technique will damage existing vegetation and cause erosion. Therefore, lighter machinery or planting by hand-tools was preferred.

The project beneficiary has agreed with the local population on the management and use of the forest and rangeland resources so that the plantations can be protected. The EMP recognized needs for controlling the use of resources (including hunting) and bush fires.

Role of EMP in M&E

The EMP was done simultaneously with the EA and planning the technical components. The EMP team included the international team leader and two local experts (biologist and geographer). The project also prepared the EA, and the documents together provide strategies and methods for due environmental consideration. The environmental expert of the project implementation unit is responsible for introducing the planting guidelines. However, according to the EMP, the contractors implementing the project are responsible for environmental protection, erosion monitoring, and control during the field operations (transportation, off-road driving, planting, resources use).

In connection with the M&E missions, the due implementation of the EA and EMP should be checked. The documents gave certain responsibilities to the governmental authorities, PIU, and especially to the contractors implementing the project. The M&E work may start by interviewing local project experts and those institutions responsible for the environmental management. Other local experts, NGOs, and population affected also should be interviewed to find out the real impacts of the project in the field. In a case of emerging environmental problems, additional conditions can be given to the stakeholders.

Source: HCG Ltd.

Fact Sheet 18. Environmental Audit (EA)

What is it?	Environmental Audit (EA) is an instrument to determine the nature and extent of all environmental areas of concern at an existing facility—usually an industrial site. The audit identifies and justifies appropriate measures to mitigate the areas of concern, estimates the cost of the measures, and recommends a schedule for implementing them. In the WB procedures, an EA also can be made for the Category B projects, which do not require a full EIA to be compiled. Within industries, an EA can be an internal and repeated process to control its negative environmental impacts.
What can it be used for? What are the benefits and challenges of using this tool?	A project-specific EA is used as part of the formal environmental analysis and review process, and particular requirements apply. An EA can be made for an (industrial) plant, a production or abandoned site, or any other site in which (industrial) pollution problems are identified or anticipated. The following types of environmental audit can be distinguished: • Site audit: Assesses onsite conditions and the extent of contamination problems • Liability audit: Requested by potential purchasers or by financial institutions when considering investment or acquisition • Compliance audit: Addresses compliance with company policies and regulatory requirements • Management system audit: Reviews both technical and organizational aspects, usually within the context of corporate environmental strategy • Waste minimization or pollution prevention audit: Examines production and waste management systems to identify improvements. The EA may request certain actions to be made (in a special Action Plan) for better environmental consideration. In the M&E, the performance of the actions should be assessed.
What does it tell you?	The EA is used to provide data on the extent of pollution in an (industrial) area, to quantify the scale of pollution at a particular site, or to examine the causes and potential remedies of problems at a facility. In the M&E, the results of EA made earlier will provide information on the environmental problems and efficiency of their mitigation. The M&E also may inquire an EA to be conducted whenever seen as necessary.
Key elements	The components of an EA have been described in many guidelines. They may include: • Material management, savings, and alternatives (Life Cycle Assessment) • Energy management and savings • Water management and economy of use • Waste generation, management, and disposal • Noise reduction, evaluation, and control • Air emissions and indoor air quality

	• Environmental emergency prevention and preparedness • Environmental Management System (EMS) set up, suitability, and performance.
Applicable scale	Applicable in all the projects in which EIA has not been prepared during the planning stage or in which unexpected problems appear. An EA also may include environmental, health, and safety audit and relate to environmental due diligence. Usually applied in individual industrial plants or production areas.
Timing	The EA is typically undertaken in three phases: Pre-audit, On-site audit, and Post-audit. In project's M&E stage, such audits can be called whenever appropriate or required.
Data requirements	A full site audit is detailed, requiring careful site inspections and review of past and present production processes, as well as pollution emissions and control measures. The audit also should clarify the legal and regulatory framework, licensing agreements, corporate policies, management structures, and priorities that affect the environmental performance of the plant.
Useful links	www.environmental-expert.com/articles/article95/article95.htm www.epa.gov/compliance/resources/policies/incentives/auditing/envaudproguidemas.pdf
References	World Bank. 1995. "Environmental Auditing." Environmental Assessment Sourcebook Update no. 11. Environment Dept.. World Bank Group. 1998. "Environmental Audits in Industrial Projects." _____. Safeguard Policies (Web pages). _____ and others. 1998. *Pollution Prevention and Abatement Handbook*. UNEP/UNIDO. 1991. "Audit and Reduction Manual for Industrial Emissions and Wastes." Paris and Vienna, respectively.

Case Example: Environmental Audit

Aligning Industrial Development with European Environmental Standards, Ukraine (World Bank and European Commission)

Description of project

The World Bank has been looking for financing opportunities in the industrial sector in Ukraine. Before launching such a program, the WB conducted en Environmental Audit in eight industrial plants to analyze the state of environmental management and to introduce international best practices in pollution prevention (Integrated Pollution Prevention and Control, or IPPC). The analyzed industries included a dairy production plant (Bershadmoloko Ltd.) and a manufacturer of fertilizers including ammonium nitrate, carbamide (urea), liquid ammonia, urea-ammonia-nitrate mixture (UAN), and ammonium sulphate (Azot Ltd).

The project objective is to help Ukraine to establish the enabling framework to converge industrial development with EU environmental standards. By decreasing local and global pollution in selected hot spots, this operation will improve the quality

of life of the urban population and competitiveness of industrial agglomerations. It also will assist Ukraine to gain access to the financial opportunities under the flexible mechanisms of the Kyoto Protocol.

Implementation of Environmental Audit

Preparatory work of the Environmental Audit project included:

- Reviewing local environmental health and safety legislation and regulatory frameworks; comparing them with EU requirements and the relevant international conventions
- Providing audit data request list for each enterprise (questionnaire on technical and management issues)
- Holding initial meetings with the Ministry of Environmental Protection.

Then the project undertook audits in the industrial facilities including:

- Visited to each facility, surrounding environment, and relevant local authorities to carry out the overall enterprise profile and the main part of the environmental performance evaluation
- Collected background information on the local environment relevant to each enterprise to be compared to EU/international and Ukrainian norms and standards
- Reviewed monitoring data, identified any important gaps, and agreed sampling that could be practically undertaken during the project
- Identified engineering expertise required for the detailed audit
- Completed the pollution release data collection and evaluation where necessary
- Undertook the operational efficiency review
- Completed the pollution impact assessment
- Identified pollution abatement investments including preparing plan of priority investments with each enterprise and the MEP.

Results of EA

Subsequently, the Environmental Audit team compiled reports on each plant describing all the issues related to their environmental management, materials, processes, energy, emissions, waste, risks, emergency preparedness, health, and safety; and gave recommendations for development and environmental investments. The international financing institutions have certain minimum requirements that the industries should meet to obtain financing. For certain plants, environmental investments are required before any other activities can be supported. Therefore the Environmental Audit report is an important document for the industrial facility whenever it looks for international finance. The report and its recommendations will then be evaluated in the M&E process of the financing project.

Source: HCG Ltd.

Fact Sheet 19. Environmental Action Plan (EAP)

What is it?	The WB encourages and supports the efforts of borrowing governments to prepare and implement an appropriate Environmental Action Plan (EAP). The Bank works with each government to ensure that information from the EAP (a) is integrated in the Country Assistance Strategy and (b) informs the development of program- and project-level details in a continuing process of environmental planning. Within the Bank, the responsibility for assisting in and monitoring the preparation of an EAP rests primarily with the concerned Country Management Unit (CMU), supported by the Regional environmental and sector unit (RESU).
What can it be used for? What are the benefits and challenges of using this tool?	Bank staff periodically monitor and evaluate progress in implementing the EAP's action program, discuss their findings with the government, and identify and promote corrective actions. Bank staff encourage and support the government's efforts to periodically update the EAP in light of new information and changing priorities. If the government so requests, Bank staff assist in identifying financial resources and expertise to update the EAP. The analysis of EAPs against the project achievements will tell how well national strategies have been adopted in the implementation of the project.
What does it tell you?	An EAP describes a country's major environmental concerns, identifies the principal causes of problems, and formulates policies and actions to deal with the problems. Together with general EAs as Regional EA and Sectoral EAs, which are instruments that examine environmental issues and impacts associated with a particular strategy, policy, plan, or program; or with a series of projects for a particular region (for example, an urban area, a watershed, or a coastal zone), EAPs will help to guide project planning to directions defined by national policies. In the M&E, the compliance of the project goals with the EAP should be checked and corrective measures proposed whenever seen necessary.
Key elements	The EAPs include the following components: • Identification of major environmental problems and threats in the country, in its regions, and in different sectors; • Priority-setting, within and across environmental media, that balances political consideration with transparent analytical criteria and analysis; • Participation of major stakeholders (including other sectors, local/regional authorities, industry NGOs and private sector) through information dissemination and a structured dialogue to build political and public support; • Cost-effective and financially feasible implementation plan involving an appropriate mix of policy, institutional, and investment actions; realistic objectives; and quantitative target setting; • Active monitoring to track the relations between policy implementation and changes in environmental quality for periodic policy reviews and updates.

Applicable scale	Applies to major strategic decisions and selections of development trends. Even an individual project or its components may contradict the EAP, and it should be assessed in the M&E if not done before.
Timing	The EAP and general EAs should be considered in project planning stage or during the project implementation if outcomes will lead to major strategic decisions and selections of development trends.
Data requirements	National EAPs, Reports of Sustainable Development, Sectoral and Regional EAs.
Useful links	www-wds.worldbank.org/external/default/main?pagePK=64187835andpiPK=64187936and theSitePK=523679andmenuPK=64187511andsiteName=WDSandpageSize=20anddocTY=540622
References	World Bank Group. 2000. Environmental Action Plans. Operational Policy 4.02.

Case Example: Environmental Action Plan

Krasnodar Agricultural Nutrient Reduction Project, Russian Federation (GEF)

Description of project

The objectives of the Krasnodar Agricultural Nutrient Reduction Project are to improve agricultural practices and environmental management in agriculture so that the country can meet its international commitments to reduce nutrient loads to the Black Sea. The emphasis is on integrated land and water management, including the reduction of nutrients (nitrogen and phosphorus) in surface and ground waters.

Strategic Action Plan for the Protection and Rehabilitation of the Black Sea (BSSAP) is a general regional strategy that has identified nonpoint sources of agricultural pollution as the most serious problem facing the Black Sea. The Russian Federation is a signatory of the Bucharest Convention and the Odessa Ministerial Declaration, and is committed to reducing nutrient loads to the Black Sea. The Krasnodar project supports the strategies identified in the BSSAP and develops solutions for pollution problems in practice.

Krasnodar Krai is one of the most intensively farmed regions in Russia: grapes, tea, subtropical crops, fruits, and wine are produced on the Black Sea coast. The area is characterized by declining soil fertility and erosion. Machinery and technologies used for soil cultivation, plant-growing, and cattle-breeding fail to meet environmental standards. Unsustainable cultivation practices have included plowing on steep slopes, poor crop rotation, and high rates of pesticide and fertilizer application. The project includes the following components:

Promotion of environmentally friendly agricultural practices component introduces mitigation practices for reducing nutrient loads, especially nitrogen, to the Black Sea. The project will support investments for improved manure management, handling, storage and use, as well as investments to reduce pollution by small-scale agro-industries, aquaculture establishments, and related agri-businesses. Environmentally friendly agricultural practices that would be promoted include nutrient management, crop rotation, conservation tillage, organic farming, buffer strips along rivers, as well as rehabilitation of wetlands areas. Investments under this component also include

facilities for soil and water quality monitoring, including relevant laboratory equipment.

Strengthening national policy, regulatory, and institutional capacities component focuses on strengthening the national legislative, regulatory, and institutional capacities of the government of Russia to address agricultural nutrient pollution control. The project would trigger policy, institutional, and legal reforms related to local zoning and local land-use planning and practices that would increase the government's capacity to address agricultural nutrient pollution control measures and honor its international commitments to reduce pollution to the Black Sea.

Public awareness and replication strategy includes a broad local and nationwide public information campaign to disseminate the benefits of proposed project activities. The objective is to familiarize the public with environmentally sustainable agricultural practices and the Code of Good Agricultural Practices, and help induce behavioral changes.

Project Monitoring and Evaluation

Project performance and outcomes are monitored and evaluated throughout the life of the project to ensure that it achieves its objectives and that lessons learned are fed back into project implementation. To this end, a Monitoring and Evaluation Plan (MEP) was developed during preparation. M&E is based on indicators specific to international waters projects; it includes process indicators, stress reduction indicators, and environmental status indicators. The M&E plan was built on the baseline survey for soil and water quality levels. Targeted annual performance and monitoring indicators were developed, and annual surveys would be conducted to monitor and evaluate project performance. The results of the survey would be measured against the baseline data to gauge effectiveness of project measures in reducing nutrient loads, especially nitrogen, to the Danube River and Black Sea. The results of M&E activities would be fed back into the implementation process as improved practices. The overall achievements of the project will be assessed based on the Strategic Action Plan.

Source: WB/HCG Ltd.

Fact Sheet 20. Participatory Environmental Monitoring

What is it?	Participatory Environmental Monitoring can be defined as a monitoring approach that develops partnerships of multiple stakeholders for efficient, effective, and socially inclusive monitoring of the environment. (LEAD Livestock and Environmental Toolbox)
What can it be used for? What are the benefits and challenges of using this tool?	It is an evolving field, but participatory environmental monitoring has three forms that can be distinguished, although they overlap: 1. Methods based on the visualization techniques of PRA 2. Methods that use oral testimony to uncover patterns of environmental and social change 3. Adaptation of methods of ecological assessment to make them more accessible to local people. The 3 methods have 6 common key principles: 1. Monitoring objectives must be clear. 2. The expectations and information needs of all stakeholders must be understood. 3. The end-users and uses of the information must be identified. 4. The monitoring process must provide recognizable real benefits for local people. 5. Participation should extend beyond indicator identification into design of data collection methods and decision on information uses. 6. Negotiations among different groups of local people may be important. There is a serious tension between "participation" and "rigor" in participatory monitoring. Can participatory monitoring data be compared across sites or be formed into valid time-series if there is local definition of indicators, which also can change with local people's changing perceptions? Many of the answers to these problems will lie in the objectives of the monitoring process itself, and where, by whom, and at what level information is being used. Different users will have different definitions of "rigor." In the early stages, it also may be useful to move gradually to externally valid monitoring, rather than endanger participation. (LEAD Livestock and Environment Toolbox)
What does it tell you?	Locally observed environmental changes based on practical indicators that the local community understand and are familiar with.
Key elements	• Transect: A structured walk through an area to observe particular indicators (for example, incidence of weeds or soil erosion, variations in quality and quantity of natural resources, or the use of innovations in different zones). (IFAD 2002)

	• Semi-structured Interviews, key informants, oral histories, focus groups, visualization techniques, triangulation. (University of Leeds, Participatory Rangeland Monitoring and Management)
Applicable scale	Local
Timing	Dependent on environmental changes being monitored.
Data requirements	Both quantitative and qualitative.
Useful links	Livestock and Environment Toolbox, Livestock, Environment and Development Initiative (LEAD), FAO, 1999. virtualcentre.org/en/dec/toolbox/Index.htm Participatory Rangeland Monitoring and Management, Environment and Development Group, Leeds Institute for Environmental Science and Management, School of the Environment, University of Leeds, www.env.leeds.ac.uk/~mreed/IVP/index.htm
References	IFAD. 2002. "Managing for Impact of Rural Development: A Guide for Project M&E."

Case Example: Participatory Environmental Monitoring

Qinghai Forestry Resource Management Project, People's Republic of China (AusAID)

Description of project

The Qinghai Forestry Resources Management Project (QFRMP) is a joint project of the Governments of China and Australia. The project tackles the linkages between environmental degradation and poverty that are a feature of the socioeconomic conditions in Qinghai. The project is being implemented in 4 counties of the Huangshui River catchment over 5 years (2002–07).

The key project outputs are strengthened forestry planning and management, developed and demonstrated improved management of forest land, and efficient and effective project management. The capacity building and demonstration activities take place in subcatchments of four counties (Huzhu, Ledu, Huangzhong, and Ping'an) that are representative of the range of environmental and social problems in the catchment.

Use of Participatory Environmental Monitoring

The project undertakes environmental monitoring at two levels: (1) project-area-wide using remote sensed images to detect overall ecological trends in the project area (beginning and end of project); and (2) in the demonstration areas using participatory monitoring of selected plots to detect whether local management is leading to rehabilitation, sustainable use, or degradation of ecological resources.

The project uses vegetative characteristics as an indicator of both the biophysical parameters of a particular site and of the condition influenced mainly by human intervention through grazing livestock. The primary focus on vegetation is based on the premise that plants and their associations reflect current and long-term influences of management, climate, and physical environment.

An initial ecological survey in 2002 identified the major vegetation communities in the area and provided comprehensive data on plant diversity and density. Technical

analysis of this data enabled trends reflecting degradation or rehabilitation of vegetation types to be determined. Based on these, a model of the ecological processes represented by the present vegetation has been developed.

This model formed the basis for an ecologically based environmental monitoring program to assess the impact of project interventions in land management within the demonstration areas. The environmental monitoring is based on parameters related to soil and vegetation that are possible to observe visually and do not require mechanical sampling or laboratory analysis. Results of monitoring are used to assess project impacts and can be used by villagers to adjust the intensity of grazing management. Both project and partner agency staff have been trained in understanding vegetation dynamics, establishing transects, and monitoring land conditions. Township staff and village representatives have set up joint monitoring teams, and men and women from the village participate in these monitoring teams.

Since 2004, participatory environmental monitoring has been set up in two demonstration areas (Pingan and Huanzhong). In the first year (2004), when transects were established, physical parameters such as altitude, aspect, and slope were recorded. Monitoring was carried out twice a year (June and October). Parameters measured in each plot included total percentage vegetation cover, percentage bare ground, rock, and litter.

Results

A recent report by the international environmental monitoring specialist recommended the following data to be collected from each sample plot: % shrub cover; shrub height; % ground cover; and % bare ground. In specific plots, depending on the vegetation type, additional data should be collected on one or more of the following: % cover grasses; % cover weeds; % cover toxic species; % cover *Artimesia vestita*; and % survival of sea buckthorn and alfalfa. The collected data will be analyzed based on trends toward or away from the intermediate phases toward the sustainable condition derived from the ecological model.

The present number of sampling plots in the demonstration areas can later be augmented by additional plots to monitor the performance of "improved systems for forest establishment" demonstrations.

Source: Project reports from ANZDEC Ltd, New Zealand (AusAID Managing Contractor) various years.

Fact Sheet 21. Indigenous Land Units (ILU)

What is it?	The ILU system combines indigenous knowledge with scientific tools (such as GPS and GIS) and interpretation to produce an evolved form of community mapping that is well understood by the stakeholders and can be used for both planning and monitoring.
What can it be used for?	• The ILU-based survey concept has led to breakthroughs in environmental understanding with key community leaders. • It points to gaps in local knowledge as well highlights where there is a wealth of local environmental knowledge. It permits a common language to be used. • The general overview helps to prevent communities and extensionists from developing local solutions that lead to problems elsewhere. • The maps produced are very powerful presentation tools to convince decision-makers. The demonstrated indigenous knowledge can be used to identify starting points for management where it exists, and issues to be addressed where it is weak. • The mapping helps to focus on the management issues and forces outsiders to understand the issue the way the locals see it—related to livelihoods.
What does it tell you?	• Communities are enthusiastic for the chance to map their land the way they see it—not via the Western or government view. The system results in considerable ownership and self-empowerment by the communities; • An advantage of using the ILU process rather than PRAs is the ability to focus the attention of community members on environmental and land management issues and planning. In contrast, with a typical PRA, issues of health, education, and roads come up as the key problems. It can be very difficult to back away from these problems and refocus on issues of forests or other environmental management; • If the ILU classification process is carried out with several communities, it gives villages an overview of an area larger than their own land. Sometimes villagers feel that "the grass is always greener" over the horizon, but with this process, they can see that the problems are more or less the same all over. Rather than believing that they can move onto free land elsewhere, communities understand they must use what they have better.
Key elements	The stages of ILU classification and mapping are: • A link with an NGO or CBO already working with the community is vital. There should already be a NRM committee or else some interested, key persons who can drive the issue forward with the community. • Project, Dept of Forestry or Lands staff, and NGO staff work together in community.

	• Key local informants are identified and taken on foot or in a vehicle to visit important areas. These areas may be crucial for a range of reasons such as water, grazing, and saltpans. It is important that resource assessments are done on site, not under a tree in a village meeting. Going on site brings more reality to the assessments. • The locations and vegetation are discussed, and the data is recorded with GPS. • A report is prepared and analyzed, and maps are prepared that combine the information gathered and the GPS data with satellite photos. Thematic maps are brought together in illustrated posters that demonstrate the various environmental aspects, including distribution maps of important tree species, water sources, and potentials and limitations of land units. The land units described are not simply soil classifications or areas with a predominant tree variety. Most descriptions represent a landscape unit that serves a specific purpose. • Feedback is given to the community in local languages in a workshop. The potentials and limitations of the information are checked, and modifications are made. • Discussion is facilitated with the community regarding realistic management options; the community is encouraged to produce a management plan. • Maps are revisited in community meetings; the GPS is used to identify changes in the land uses (for example, spread of deforested areas).
Applicable scale	This is a local-level process; however, the information produced has been used to produce maps for entire countries (for example, Namibia).
Timing	At planning and then monitoring and evaluation stages.
Data requirements	GPS and GIS make the mapping process easier and more replicable; however, it can be done with hand drawn maps. Satellite images or aerial photos also make the final product easier to understand but are not vital. The most important requirement is the description of the land unit and uses.
Useful links and references	Nott, C., and A. Verlinden. 2002. "Participatory Natural Resource Information Systems for Community-Based Natural Resource Management. A Report of the Surveys in Selected Areas of North Central Namibia." National Remote Sensing Centre, Windhoek. December. IIED. 2006. "Mapping for Change: Practice, Technologies, and Communication." A special issue on Participatory Spatial Information Management and Communication and Participatory Geographic Information Systems (PGIS). Participatory Learning and Action 54. April. www.iied.org/NR/agbioliv/pla_notes/current.html

Case Example: Indigenous Land Units

Namibia-Finland Forestry Programme (NFFP) Phases I and II, Namibia (Ministry for Foreign Affairs of Finland)

Description of project

The NFFP ran from 1997–2005 and supported these components: institutional strengthening, forest fire management, forest inventory, and participatory forest management.

Use of ILU

Indigenous Land Unit (ILU) classification has been successfully used within the NFFP Phases I and II, and also is being used by many NGOs, by other projects, and by some DoF staff. The process also has been replicated successfully in Malawi in another Finnish-funded forestry project (Sustainable Forest Management Programme).

The land units described are not simply soil classifications, nor areas with a predominant tree variety. Most units represent a landscape unit that serves a specific purpose. A key issue in many areas is to understand the movement and distribution of water following rainfall. Discussions with the communities and informants have made clear that resource management strategies vary according to the presence, abundance, and geographic distribution of the units. The NRSC has produced lists of quite detailed descriptions (including geomorphology, soil types, vegetation, hydrology, potentials, and limitations) of each ILU, and published them on the DoF website. Descriptions of participatory mapping exercises using the ILU classification system also were available on this site.

In Namibia, the available remote sensing material is used. African countries have basic GIS and remote sensing (RS) capacity and equipment to use in the ILU classification process. If the available material is more than a few years old, low-cost Landsat images can be bought to get a recent picture. If there is no capacity in the country, mind maps or other PRA-style mapping processes can be used, or more labor-intensive mapping based on field collected GPS data can be done. The approach does not depend on remote sensing, but the available technology can speed up the process. Some extension workers have been skeptical of villagers' ability to understand computer-generated maps. However, experience in Namibia and Malawi has shown that villagers have a good understanding of GPS and computer-based mapping.

In Namibia there is a wealth of indigenous environmental classifications, but there are gaps in understanding changes as a response to different impacts, such as heavy grazing. Recently, the ILU classification system was successfully applied also in Malawi (in the Finnish-funded Sustainable Forest Management Programme).

Results

Key issues in Namibia have been:

- A link with an NGO or CBO working already with the community is vital. There should be a pre-existing NRM committee or interested, key persons who can drive the issue forward with the community. Committees working with other issues such as grazing can be used and other issues inserted to raise their attention.
- First, the researchers or planners must visit the traditional authority or council to get permission. They ask for the names of people who have great environmental knowledge. It is advisable to ask both women and men–including the elderly. The knowledge appears not to be gender, wealth or age specific and is very

widespread. Then these informants should be taken along on foot or in a vehicle to visit important areas. These areas may be crucial for a range of reasons such as water, grazing, and saltpans. It is important that resource assessments are done on site, not under a tree in a village meeting. On site brings more reality to the assessments.

- On the way the researchers or planners ask the local person the names of trees, other vegetation, or landscape units they pass, as well as the uses, how do the local people identify it, and what limitations there are on its suitability for a task. Questions also are asked regarding crops, grazing potential of an area, soils, and landscapes. The locations are noted with GPS. Images are prepared using this information and Landsat TM imagery and aerial photographs.
- A key aspect is that surveyors are required to understand the way that the community views and manages the environment. The land units described are not simply soil classifications or areas with a predominant tree variety. Most descriptions represent a landscape unit that serves a specific purpose.
- Feedback is given to the community in a workshop facilitated by locals in local languages. The potentials and limitations of the information are checked and modifications made. Once the maps are explained and key landmarks are noted, local communities have had no difficulty in understanding the maps.
- Discussion is facilitated with the community regarding realistic management options; the community is encouraged to produce a plan. Inputs and management are facilitated by the NGO.
- Maps are revisited in community meetings. The GPS is used to identify changes in the land uses (for example, spread of deforested areas) and compare with the baseline. Then the changes can be discussed.

A key issue in many areas is understanding the movement and distribution of water following rainfall. Discussions with the communities and informants have clarified that resource management strategies vary according to the presence, abundance and geographic distribution of the units. The main characteristics used in identifying ILUs are vegetation structure (height and relative densities of woody species), indicator species, presence of a hard pan at certain depth, landform (slope, size of elevated area, depression, plateau), and soil structure (harder surface or soft sand). The main farming strategies are explained through using the local people's understanding of the dynamics of water transport through the environment in response to rainfall.

The development of a Geographic Information System (GIS), a database of indigenous knowledge and natural and physical resources, has laid the groundwork for better rangeland management. The ILU classification system has been used to positively influence the attitudes of extensionists and villagers and to improve their understanding of rural livelihood strategies, combining indigenous and scientific knowledge. Based on the classifications, people could indicate which land units had changed over time due to heavy grazing or other changes in management. These findings were in agreement with the changes recorded by scientific measurement.

Sources: NFFP I and II documents, DoF documents from Namibia, authors' and HCG staff experiences.

Fact Sheet 22. Participatory Forest Survey (PFS)

What is it?	Community members participate in planning and implementing forest surveys together with professionals from respective government and/or other organizations. Planning includes selecting survey methods and characteristics to be measured and recorded.
What can it be used for? What are the benefits and challenges of using this tool?	• To learn as much as possible about every part of the forest (to see boundary markers, different land-use practices) and how the forest will perform if a number of management options are instituted. • To understand what forest resources are available—wood products and nonwood products, for example, grass for grazing and thatch, fruit, and mushrooms. The local names and priorities of the forest products and sites also can be obtained. • To enable forestry officers and villagers to come to the important shared understanding of what management practices may be required to yield the benefits that they desire (fire control, controlled grazing). • To establish which resources, for example, labor, equipment, or commitment, are available to manage the resources responsibly. • To hear diverse views in an informal setting. Different people in the community use the forest for different things, for example, women, herbalist doctors, cattle owners, rich people, and poor people. This survey is a good opportunity to hear their opinions away from any intimidating influence, such as a public meetings. Often people are more willing to address sensitive issues such as land ownership patterns or conflicts when they are away from their communities. Similarly, a question related to a phenomenon being observed can seem less intrusive than the same question asked in a more formal interview. • The survey is an opportunity ask the people about their particular needs and problems, and what they think are possible solutions. • To investigate seasonality of use/seasonality of supply of the range of forest products. • Afterwards, forest officers can analyze data collected and agree with the community on how to proceed.
What does it tell you?	Gives forestry professionals a chance to build understanding and trust with local people and to access their indigenous knowledge about forest resources, boundaries, access rights, use patterns, and management practices. Participatory forest surveys provide baseline knowledge and ideas on how the forest will perform if management options are instituted. However, they are ***not*** forest inventories; the latter require more specialized expertise.
Key elements	• Using PRA techniques, forestry professionals (project staff or government ministries) hold community meetings to list

	forest products and their availability, who uses them, and changes in the history of the forest. It is useful to conduct a stakeholder analysis and a SWOT analysis. • A group of selected informants (a cross-section of the community) then take a walk together in the nominated forest area (not a scientific transect, but a walk-around). • The presence of resources is recorded on a form. • A basic visual assessment is made of tree resources—for example, presence of large trees, >100cm girth, pole size trees, and fuelwood. The species are listed and marked as none/few or abundant. Medicinal plants (and their uses), and other NTFPs (nontimber forestry products) are recorded. • Notes are made as to the presence or absence of encroachment of agriculture, fire damage, illicit cutting, or wildlife, as well as evidence of management/silvicultural operations. • Coordinates and descriptions of zones are marked down (for example, shrubland, closed forest). • The group sits down together to prepare a map—initially, a hand-drawn map can be used—that shows the relevant boundaries and zones. Later, the forestry officers can use the GPS coordinates (if used) in conjunction with hand-drawn maps and either aerial photos or satellite images to produce more detailed maps. These should be revisited with the community informants to check for accuracy. If there are conflicts of interest among different members of the village, efforts must be made to discuss and resolve them.
Applicable scale	Local; usually a step in preparing a local participatory forest management plan.
Timing	In planning stages and then revisited during monitoring to see changes.
Data requirements	Both quantitative (for example, species types and density) and qualitative (for example, opinions of villagers).
Useful links and references	FAO. 2001. Global Forest Survey, Field Site Specification and Guidelines. www.fao.org/documents/show_cdr.asp?url_file=/docrep/006/ad675e/ad675e08.htm

Case Example: Participatory Forest Survey

Sustainable Forest Management Programme, Malawi (Ministry for Foreign Affairs of Finland)

Description of project

The project for Capacity Development of District Forestry Extension Staff in Social Forestry in Six Districts of the Northern Region of Malawi (Sustainable Forest Management Project, or SFMP) was initiated to improve the institutional capacity to provide effective and efficient forestry extension services to rural communities. This purpose was achieved via collection and dissemination of experiences and lessons

concerning social forestry, capacity building of extension staff, and improved logistics and support for forest extension at the district level.

Use of Participatory Forest Survey

A participatory forest survey was used as the second step in preparing a Participatory Management Plan for village forest areas (VFAs). The survey was divided in two parts: (1) discussion with the community to establish use patterns and needs assessment, including interviews and observations; and (2) investigation of available forest resources via conducting an investigation walk and GPS survey, then zoning and sketch mapping with community members. The key steps were:

- Begin the process of boundary definition. Perimeter boundary: Defining the perimeter usually will involve meetings at the site with representatives from neighboring villages who share the boundary. Plan to involve elders. The following criteria may apply: forest boundary, condition, uses and users, and management. If more than one subvillage borders the forest, it is usually best for the planning team to go with members of the subvillages to the forest and to learn about 'their' part of the forest together. Decisions will need to be made as to how the boundary will be permanently marked.
- Use GPS for collecting waypoints of VFA and zone boundaries as well as for coordinates of the important features within the VFA.
- Stratify forest woodland according to use and function, that is, zone out portions of VFA according to resources or use of products (develop a checklist of uses).
- Determine and record zones. Possible zones are (1) protection zones: part of the forest area may be designated for soil and water conservation, (2) timber production zone, (3) grass cutting zone, (4) beekeeping zone, (5) grazing zone, (6) mushroom collection zone, (7) fuelwood and pole collection zone, or a combination of any of these.
- Make observations on wood and nonwood resources in each zone, including scientific and local names.
- Make a progressive checklist of forest uses. Encourage community/team members to identify problems and suggest solutions. At the end of each day in the forest, group members agree on the problems that have been identified and the actions that need to be taken. These will probably alter as group members learn and discuss more.
- Download GPS waypoints to MapSource/MapInfo program to produce accurate VFA maps and area calculations.
- Sort the findings. At the end of the forest survey, group members sit together and
  - Rank all forest uses and extent of damage they cause
  - Rank the importance of each forest use to the majority of village members
  - Distinguish natural zones of the forest by vegetation or special sites; identify the needs of each zone
  - Prepare a sketch map of the forest with the community.

A more detailed inventory was then carried out to establish potential off-takes from the forest.

Results

This step can become overly complicated and take a lot of time. However, it is an important basic step for planning participatory forest management—and very useful as a means to record changes due to management changes. It allowed the forestry

officers to get a hands-on understanding of how the forest is used and what the problems are, as well as to build a relationship with the villagers. For truly participatory forest management (with both forest department and villager inputs), this common understanding is vital, and it enables villagers to report on the changes they have seen.

Source: Department of Forestry Malawi 2003.

References

ADB (Asian Development Bank). 1994. "Handbook for Incorporation of Social Dimensions in Projects." Manila.

_____. 2001. "Gender Checklist: Agriculture." Manila.

ADF (African Development Fund). 2004. "Farm Income Enhancement and Forest Conservation Project: Uganda." Draft Final Report.

ANZDEC Ltd. Various years. Project reports from New Zealand. (ANZDEC is AusAID Managing Contractor.)

Bayer, W., and A. Waters-Bayer. 2002. "Participatory Monitoring and Evaluation (PM&E) with Pastoralists: A Review of Experiences and Annotated Bibliography." Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), Eschborn.

Bertens, J. 2003. "Consultancy on Economic and Social Impact of Rural Infrastructure Works in Phong Dien District. Final Report." Thua Thien Hue Rural Development Programme.

Bessette, G. 2004. "Involving the Community: A Guide to Participatory Development Communication." Penang, Malaysia: Southbound and Ontario, Canada: IDRC. www.idrc.ca/en/ev-52226-201-1-DO_TOPIC.html

CAFTA (Central American Free Trade Agreement). 2003. "Fair Trade or Free Trade: Understanding CAFTA." An Educational Briefing Packet. www.andrew.cmu.edu/user/mtoups/cafta_briefing_final_dec03.pdf

Chambers, R. 2002. "Relaxed and Participatory Appraisal: Notes on Practical Approaches and Methods for Participants in PRA/PLA-Related Familiarisation Workshops." IDS (Institute for Development Studies), University of Sussex, UK. www.eldis.org/cf/search/disp/docdisplay.cfm?doc=DOC10933andresource=f1

CIAT (International Center for Tropical Agriculture). 2005. "CIAT in Focus, 2004–2005: Getting a Handle on High-Value Agriculture." Cali, Colombia. www.ciat.cgiar.org

CONAFOR. 2004. "Plan Rector Nacional de Educación y Capacitación Forestal 2004–2025."

De Haan, C. 2006. "Managing Livestock Sector Externalities: Public 'Goods' and 'Bads' of the Livestock Sector and Their Implications for Public Policy." Agriculture and Rural Development Dept., World Bank. Working draft.

Deininger, K., P. Olinto, and M. Maertens. 2000. "Redistribution, Investment, and Human Capital Accumulation: The Case of Agrarian Reform in the Philippines." http://siteresources.worldbank.org/INTABCDEWASHINGTON2000/Resources/deininger.pdf

DfID (Department for International Development). 2002. "Tools for Development: A Handbook for Those Engaged in Development Activity." Performance and Effectiveness Dept. London. September.

Department of Forestry (Malawi). 2003."Guidelines for Fieldwork," *Preparing Participatory Management Plans for Indigenous Forests on Customary Lands* (Vers. 2). Internal report distributed to the Malawi Dept. of Forestry staff.

Dick, R. N.d. "Resource Papers in Action Research." www.scu.edu.au/schools/gcm/ar/arp/focus.htm

Dolan, S., and K. Sorby. 2003. "Gender and Employment in High-Value Agriculture Industries." Agriculture and Rural Development Working Paper 7. World Bank.

Earth Council, The. N.d. "Subsidies and Sustainable Development: Implementing Environmentally Friendly Economic Instruments." www.ecouncil.ac.cr/econ/subsidies/amdoc964.htm#Subsidy.

Elliott, J. 1999. "Sustainable Rural Livelihoods." In *An Introduction to Sustainable Development.* 2d ed. London: Routledge.

Estrella, M., and J. Gaventa. "Who Counts Reality? Participatory Monitoring and Evaluation: A Literature Review." IDS Working Paper 70. Institute of Development Studies, University of Sussex. www.worldbank.org/participation/ partme.htm

FAO (Food and Agriculture Organization of the United Nations). 1999. "Indicators for Sustainable Development of Marine Capture Fisheries: Technical Guidelines for Responsible Fisheries." Rome. www.fao.org

_____. 2003. "Report of the International Conference on the Contribution of Criteria and Indicators for Sustainable Forest Management: The Way Forward." CICI-2003. 3–7 February 2003. www.fao.org

_____. 2005. "Socioeconomic and Gender Analysis (SEAGA) Livestock Guide: Planning with a Gender and HIV/AIDS Lens." Gender and Development Service, FAO, Rome. www.fao.org

Gibbs, A. 1997. "Social Research Update: Focus Group Discussions." www.soc.surrey.ac.uk/sru/SRU19.html

Herweg, K., and K. Steiner. 2002. "Impact Monitoring and Assessment: Instruments for Use in Rural Development Projects with a Focus on Sustainable Land Management." Vol. 1: Procedure; Vol. 2: Toolbox. Centre for Development and Environment, (CDE), University of Berne, and Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), Eschborn. www.portals.wdi.wur.nl/files/docs/ ppme/impactmonitoringandassessment.pdf
and www.cde.unibe.ch-imavol2en.pdf

IFAD (International Food and Agriculture Development). 2002. "Managing for Impact of Rural Development: A Guide for Project M&E." Office of Evaluation and Studies. Rome.

_____. N.d.(a). "Rapid Nutrition Surveys for Estimating Project Impact." Website report, accessed on June 26, 2006, www.ifad.org/hfs/tools/hfs/nutrition.htm

_____. N.d. (b). "Practical Anthropometry 101: Tools for Preparing a Survey" and "Practical Anthropometry 102: Collecting Anthropometric Measures of Children." Training Handbooks. www.ifad.org/gender/tools/hfs/anthropometry/ant_toc.htm

IISD (International Institute for Sustainable Development). N.d. "Criteria and Indicators of Sustainable Forest Management: IISD Linkages (multimedia resource for environment and development policy-makers)." Winnipeg. Accessed on June 26, 2006 at www.iisd.ca/forestry/criteria.html

IUCN (International Union for Conservation of Nature and Natural Resources). 1997. "Participatory Health Appraisal." In T. Barton, G. Borrini-Feyerabend, A. de Sherbinin, and P. Warren.1997. *Our People, Our Resources.* Gland, Switzerland and Cambridge, UK. www.iucn.org/themes/spg/Files/opor/opor4_3.html#health

Jurvelius, M., and J. Kawana. 1998. "30 Percent Reduction in Fire Incidents in Three Years." IFFN (International Forest Fire News) 19. Timber Section, UN-ECE Trade Division, Geneva.

Mwalweni, J.M., and C.A.P.S. Msukwa. 2002. "Training Needs Assessment Report." Regional Forestry Office (North), Sustainable Forest Management Programme, Mzuzu, Malawi. July.

Nichols, P. 1991. *Social Survey Methods. A Fieldguide for Development Workers*. Development Guidelines 6. Oxford: Oxfam Publications.

OECD (Organisation for Economic Co-operation and Development). 2002. "The Development of Agri-Environmental Indicators in the EU: The IRENA Project." Paper prepared by G. Pisano, European Commission. Paris. www.oecd.org/dataoecd/14/49/2386860.pdf

Olsson, J.A., T. Hilding-Rydevik, H. Aalbu, and K. Bradley. 2004. "Indicators for Sustainable Development." Paper for Discussion at the European Regional Network on Sustainable Development, Cardiff, 23–24 March 2004. Draft. February 12.

Pearce, D. 2002. "Environmentally Harmful Subsidies: Barriers to Sustainable Development." OECD, Paris. www.oecd.org/

Rajalahti, R., J. Woelcke, and E. Pehu. 2005. "Monitoring and Evaluation for World Bank Agricultural Research and Extension Projects: A Good Practice Note." Agriculture and Rural Development (ARD) Discussion Paper 20. Agriculture and Rural Development (ARD) Dept., World Bank.

Shyamsundar, P. 2002. "Poverty-Environment Indicators." Environmental Economics Series Paper 84. Environment Dept., World Bank.

Sida (Swedish International Development Cooperation Agency). 2002. "Indicators for Environmental Monitoring in International Development." Stockholm.

Start, D., and I. Hovland. 2004. "Tools for Policy Impact: A Handbook for Researchers." Research and Policy in Development (RAPID), ODI. www.eldis.org/cf/search/disp/docdisplay.cfm?doc=DOC16876andresource=f1

Steinfeld, H., C. De Haan, and H. Blackburn. 1997. "Livestock-Environment Interactions: Issues and Options." Fressingfield, Eye, Suffolk, UK: WRENmedia. Report of a Study Sponsored by the Commission of the European Communities, the World Bank and the Governments of Denmark, France, Germany, the Netherlands, United Kingdom and United States of America. The study was coordinated by the Food and Agriculture Organization of the United Nations, United States Agency for International Development, and World Bank. Accessed at www.virtualcentre.org/en/dec/toolbox/FAO/Summary/index.htm

Department of Forestry Malawi. 2003. "2004 In-Service Training Programme for Forestry Extension Staff of the Northern Region." Sustainable Forest Management Programme. Mzuzu, Malawi. December.

Trochim, W. M. K. 2001. *The Research Methods Knowledge Base.* 2d ed. Cincinnati: atomicdog publishing.

USAID (United States Agency for International Development). 1996a. "Conducting Key Informant Interviews." Center for Development Information and Evaluation. www.usaid.gov/pubs/usaid_eval/ascii/ pnabs541.txt

_____. 1996b. "Performance Monitoring and Evaluation Tips: Using Direct Observation Techniques." No. 4. Accessed at pdf.dec.org/pdf_docs/ pnaby208.pdf

United States Dept. of Transportation. N.d. "Key Person Interviews." Accessed at www.fhwa.dot.gov/reports/pittd/keypers.htm

Waglé, S., and P. Shah. 2004. "Report Card: A General Note on Methodology." Social Development Dept., World Bank.

White, P., and I. Mustalahti. 2005. "Finnish Forestry Assistance: Success Story or Failure? Analyses of Case Studies from Sub-Saharan Africa and Their Possible Impacts on Poverty Reduction." *Silva Carelica* 48.

World Bank. 1991. *Environmental Assessment Sourcebook*. Vols. I–II. World Bank Technical Papers 139 and 140.

_____. 1996a. "Performance Monitoring Indicators: A Handbook for Task Managers." www.worldbank.org/html/opr/pmi/maintxt.html

_____. 1996b. *The World Bank Participation Sourcebook*. Appendix 1. Methods and Tools. www.worldbank.org/wbi/sourcebook/sba104.htm

_____. 1999. Operational Policies 4.01. Environmental Assessment. www.worldbank.org

_____.2000. Operational Policies 4.02. Environmental Action Plans.

_____. 2002. "Community-Based Monitoring and Evaluation Team. Sleeping on Our Own Mats: An Introductory Guide to Community-Based Monitoring and Evaluation."

_____. 2003a. "A User's Guide to Poverty and Social Impact Analysis." Poverty Reduction Group (PRMPR) and Social Development Dept. (SDV).

_____. 2003b. "Social Analysis Sourcebook." Social Development Dept. (SDV).

_____. 2004. "Monitoring and Evaluation: Some Tools, Methods and Approaches." Operations Policy Dept.

_____. 2005a. "Empowering People by Transforming Institutions: Social Development in World Bank Operations." Social Development Dept. (SDV).

_____. 2005b. "Food Safety and Agricultural Health Standards: Challenges and Opportunities for Developing Country Exports." Report no. 31207.

_____. 2005c. "Gender Issues in Monitoring and Evaluation in Rural Development: A Toolkit." Agriculture and Rural Development Dept. (ARD)

_____. 2005d. "Gender Issues and Best Practices in Land Administration Projects: A Synthesis Report." Report 32571-GLB. Agriculture and Rural Development Dept. (ARD).

World Bank ESSD Environment Dept. 2006. "The Road to 2050: Sustainable Development in the 21st Century." http://siteresources.worldbank.org/ESSDNETWORK/Resources/Roadto2050Part1.pdf

World Bank ESSD Forest Team. 2004. "Progress Report on Implementation of the Revised Forest Strategy and Policy." August. Environment Dept.

World Bank Group, UNEP, and UNIDO. 1998. *Pollution Prevention and Abatement Handbook: Toward Cleaner Production*.

Useful websites:

Dick, R. N.d. Resource Papers in Action Research. www.scu.edu.au/schools/gcm/ar/arp/focus.htm

Gibbs, A. 1997. Social Research Update: Focus Group Discussions. www.soc.surrey.ac.uk/sru/SRU19.html

Start, D., and I. Hovland. 2004. "Tools for Policy Impact: A Handbook for Researchers." Research and Policy in Development (RAPID). ODI, London. www.eldis.org/cf/search/disp/docdisplay.cfm?doc=DOC16876andresource=f1

World Bank. "WB's Living Standards Measurement Study." www.worldbank.org/LSMS/