**Sector Guidelines and Generic TORs for**

**Environmental and Social Impact Assessment**

 **Land Degradation**

**Sector Guidelines[[1]](#footnote-1)**

The definition of land degradation is “any form of deterioration of the natural potential of land that affects ecosystem integrity either in terms of reducing its sustainable ecological productivity or in terms of its native biological richness and maintenance of resilience.” Land degradation is a major threat to biodiversity, ecosystem stability, and society’s ability to function. Because of the interconnectivity between ecosystems across scales, land degradation triggers destructive processes that can have cascading effects across the entire biosphere. Loss of biomass through vegetation clearance and increased soil erosion produces greenhouse gases that contribute global warming and climate change.

FECO’s project areas for financing include three major production practices: sustainable agriculture (crop-livestock systems), sustainable rangeland management (agro-pastoral systems), and sustainable forest and woodland management.

**Section I Sustainable agriculture**

It is useful to divide agricultural projects into two categories: lowland, irrigated agriculture and upland, rainfed agriculture. Each has its own set of potential environmental problems. Impacts of agrochemicals and irrigation are primary concerns in the lowlands, and in the uplands, problems of erosion, loss of soil fertility, improper land use and watershed management are more likely to be encountered. Sustainability in agriculture will minimize soil and nutrient loss, and balance inputs with harvests, and strengthen the links between the farmer, extension and research. Environmental prudence, sustainability, and relevant technologies will be fostered by improving the links between farmer and research.

The main environmental impact to be aware of is the irreversible loss of habitats. It is most critical when it is "wildland," but even degraded habitats, e.g., urban wetlands, perform valuable services. Such loss reduces economically valuable environmental services and accelerates extinctions and loss of wildlife. This loss can occur from two main causes: first, access roads that reach the project area; and second, clearing natural habitat for planting and processing of crops. Access roads leading into the project area or near habitat may facilitate unplanned settlements and destruction of that habitat. Loss of socio-economic services can result in increased pressure or conversion of other lands. If grasslands are converted, for example, grazers will have to graze their herds elsewhere. Indigenous peoples are particularly vulnerable. Similarly, when clearing new lands for the production or processing of crops, if the new land is wildland or other habitat, and especially if it is critical habitat such as tropical forests, preventive measures, precautions and policies should be used for any guidance sought.

The lesser impacts are largely reversible and preventable. On occasion, however, they can be severe. The lesser impacts fall into only three categories: agro-chemical runoff contaminating water and ground water, pesticide concerns, and effluent disposal from crop processing.

**Section II Sustainable Rangeland Management**

FECO finances projects targeting the improvement of rangeland condition and productivity. Rangelands include grasslands, open forest (and in some places cleared areas of closed forests), shrublands, and deserts that support domestic ruminants and wild herbivores.

**1. Potential Environmental Impacts**

Rangeland management techniques to increase the productivity of the rangeland include: mechanical and physical work on the soil or vegetation (e.g., land contouring and other soil and water conservation techniques, bush clearing); planting, seeding or re-seeding with selected species and varieties; burning the vegetation; fertilization with manure or chemicals and pest control efforts. Soil and water conservation measures and seeding of vegetation can decrease soil erosion, while bush clearing and burning, if not carefully carried out may increase erosion. Not only does site productivity decline with increased erosion, but water bodies suffer from increased levels of sediment input.

Burning is the oldest practice used by man to manipulate range vegetation for livestock grazing. Burning is done to control undesirable brush and tall weeds, destroy old, unpalatable grass tussocks, and favor the growth of fresh, more digestible and nutritious grasses. Fire increases forage yield and palatability of grasses and forbs. Haphazard or accidental burning, however, can be harmful or disastrous for the vegetation and soils, and can lead to increased levels of soil erosion.

Use of chemicals for fertilization of pasture or for pest or disease control can have negative environmental impacts. Chemical fertilization is prohibitively expensive and thus rarely practiced in most developing countries. Where used, however, it can cause water pollution problems, as can fertilization with organic materials. Use of chemicals as herbicides or for disease control (e.g., reducing the tsetse fly population to control trypanosomiasis) is more common and can have negative effects on wildlife, water supplies (surface and ground waters) and vegetation.

Rangeland management systems and socio-economic patterns and conditions are intimately linked. A decline in rangeland productivity will through natural (e.g., climatic) or humanly driven forces, have negative impacts on family income, health, and the distribution of scarce resources between people. Conversely, socio-economic factors such as labor availability, distribution of tasks within families, land use and resource rights, property ownership patterns, and market conditions affect how the range and livestock resources are managed.

Many rangeland areas are in a state of transition. The most important social and economic changes in these areas include: (a) increased involvement in wage-labor markets; (b) transformations of indigenous tenure systems and organizations; (c) encroachment of dryland agriculture and irrigation into rangelands; (d) increased involvement of pastoralists in commodity markets; (e) increased sedentarization and settlement that is often encouraged by state and donor policies and programs; and (f) fluctuating terms of trade for pastoral produce. In terms of their potential effects on the physical environment, the most important variables to identify are income and welfare levels, labor availability, and land/population ratios. Changes in these are likely to affect how physical resources are managed, as are changes in people's traditional access to resources.

The key social issues which must be considered before developing any rangeland management project are spacial and temporal dimensions of rangeland economics; resource tenure and local management; property rights, distribution, and welfare; and labor availability.

**2. Monitoring**

Factors to be monitored in a livestock project should include:

(1) Range condition (assessment of present state of health of the range in relation to its potential);

(2) Range trend (direction of change of range condition);

(3) Availability of and access to natural fodder and forage, cultivated fodder, and imported feedstuffs (in stallfed animals) numbers and types of animals;

(4) Seasonal distribution and movement of animals;

(5) Condition of the livestock (weight, presence of disease, other health indices);

(6) Condition of the soil (i.e., signs of increased erosion, compaction, decreased fertility, etc.);

(7) Water points (location, condition, and intensity of use, and condition of vegetation around the water points);

(8) Market conditions (changes in price, development of alternative markets, etc.);

(9) Changes in economic indices of livestock producers (e.g., income levels and health);

(10) Changes in social organization;

(11) External land use changes and demographic changes which have impacts on the range resource and livestock producers;

(12) Changes in wildlife populations and habitat due to livestock production.

**Section III Sustainable Forest Management**

**I. Reforestation**

FECO finances projects and project components which plant trees for environmental protection. Protection-oriented activities include planting trees for slope stabilization, sand dune fixation, shelter belts, various agroforestry systems, living fences and shade trees.

**1. Potential Environmental Impacts**

Reforestation provides a range of environmental benefits and services. Reestablishing or increasing tree cover can increase soil fertility by improving moisture retention, soil structure, and nutrient content (by decreasing leaching, providing green manure, and adding nitrogen if nitrogen-fixing species are used). Where shortages of fuelwood have caused the use of animal dung for fuel instead of fertilizer for agricultural fields, fuelwood production indirectly will help maintain soil fertility. Tree planting stabilizes soils by reducing water and wind erosion on slopes, in adjacent agricultural fields, and on unconsolidated soils such as sand dunes.

Establishing tree cover on bare or degraded lands helps reduce rapid runoff of rainwater, thus regulating stream flow and improving water quality by reducing sediment inputs into surface waters. Cooler temperatures and moderated wet and dry cycles under trees provide a favorable microclimate for soil microorganisms and wildlife, and can help prevent soil laterization. Plantations have a moderating effect on winds and help settle dust and other particulates out of the air. Incorporating trees into agricultural systems can improve crop yields, by virtue of their positive effects on the soil and climate. Finally, the increased vegetation cover established by large scale plantation development and tree planting projects represents a carbon sink, a short-term answer to global warming caused by carbon dioxide build-up in the atmosphere.

Plantations are man-made forests whose trees are treated essentially as long rotation agricultural crops. As such, many of the negative environmental impacts inherent in agriculture are present in plantation forestry. The degree of impact depends in large part on site conditions prior to planting, site preparation techniques, the species planted, treatments during the rotation, length of rotation, and harvesting methods. Reforestation and afforestation activities, particularly in drier regions, can deplete soil moisture, lower water tables, and affect base-flow into streams.

Like any agricultural crop, plantations of fast growing, short rotation trees can deplete soil nutrients and decrease site fertility by repeated removal of biomass and disturbance of the soil. Although this also can be true of long rotation species, the effects are less obvious. Soil compaction and damage occur during site clearing (removal of vegetation through physical means or burning), mechanical site preparation and harvesting. Erosion can occur in plantations with incomplete canopy closure or limited undergrowth. Accumulation of leaf litter under plantations increases the risk of fire and decreases rainwater infiltration, and the dominance of one or two species in the leaf litter can change chemical and biological characteristics of the soil. Leaf litter of coniferous (e.g., pine) plantations can acidify the soil.

Some species are allelopathic, producing toxins which inhibit seed germination of other species. Irrigated plantations can compete with other demands for water and cause other environmental and social impacts common in irrigation projects. The return water from irrigated plantations in semi-arid areas may be saline, rendering it less useful for other purposes and degrading the quality of surface waters into which it feeds. Chemicals (pesticides and biocides) used to control insect pests and diseases, and fuel and oil used in forestry equipment can pollute surface and ground water and can be a direct health hazard for those that use them.

Conservation plantings are often established with exotic rather than native species. Using exotics in an area for the first time always carries a risk. While the use of exotics has been very successful in many places, it has caused problems or unrealistically high expectations in others. An exotic introduced into a new environment does not always do as well as anticipated. This can be due to unsuitable site conditions at the margins of the species' ecological tolerance (i.e., rainfall, temperature); attacks of pests or diseases (sometimes devastating) to which the species has little or no resistance; and inadequate site preparation, planting and subsequent plantation maintenance.

**2. Monitoring**

The following factors should be monitored:

(1) Environmental impacts of site preparation and replanting quality of planting stock;

(2) Growth rates of the plantation;

(3) Weed problems;

(4) Presence of pests and disease;

(5) Management treatments: if being done properly and according to schedule;

(6) Protection of the stands;

(7) Pressure on agriculture, land tenure, natural forests environmental impacts of harvesting;

(8) Long-term viability of the plantation from ecological, economic and managerial standpoints.

**II. Natural Forest Management**

Proper management of natural forests can and should preserve the forests' capacity to render environmental services, conserve biological diversity, and provide livelihoods for various people (including indigenous forest dwellers or tribal peoples who represent endangered cultural assets). Maintaining an area under forest cover controls erosion, stabilizes slopes, moderates streamflows, protects aquatic environments, maintains soil fertility, preserves wildlife habitat, and provides non-wood forest products important to local economies and households. Sustained harvest of forest products can provide the economic incentive to help prevent conversion of that forest to more destructive land uses and relieve pressure on other forests which are best left undisturbed or under low-impact resource use.

**Generic Terms of Reference**

These terms of reference will be used when commissioning an assessment of land degradation as part of the environmental and social impact assessment (ESIA) and should be adapted and tailored to each specific situation. The actual scope and depth of the assessment will be determined by the nature, complexity and importance of the issues studied, as identified in the screening process.

**Introduction and Background**

1. Introduction. This section should state the purpose of the terms of reference, identify the development project to be assessed, and explain the executing arrangements for the ESIA.

2. Background information. Pertinent background for potential parties who may conduct the ESIA, would include a brief description of the major components of the proposed project, a statement of the need for it and the objectives it is intended to meet, the implementing agency, a brief history of the project, (including alternatives considered), its current status and timetable, and the identities of any associated projects. If there are other projects in progress or planned within the region which may compete for the same resources, they should also be identified here.

3. Objectives. This section will summarize the general scope of the ESIA and discuss its timing in relation to the processes of project preparation, design, and execution.

4. ESIA requirements. This paragraph should identify any regulations and guidelines which will govern the conduct of the assessment or specify the content of its report. They may include any or all of the following:

* FECO Environmental and Social Safeguards Standards;
* National or provincial laws and/or regulations on environmental reviews and impact assessments;
* ESIA regulations of any co-financing organizations involved in the project.

**Required Qualifications and Expertise**

The expert or team of experts should have solid experience in ESIA with a special expertise on soil science and soil management technologies, land use systems and the ecosystem under study. Expertise in social assessment and public participation is required.

**Scope of Work**

**Task 1. Legal, political and institutional context**

This chapter should provide relevant information about the legal, political or institutional context – at national and site level. It should include reference to pertinent sector policies, environmental laws, regulations and standards as well as explore issues regarding institutional arrangements and institutional capacity.

**Task 2. Description of baseline information**

Baseline data is important in order to describe and map the receptors in the project site and to understand their sensitivity. The data is also key for defining mitigation measures, developing a monitoring plan and setting targets. Data provided should include a description of the project site and the bio-physical and socioeconomic conditions relevant to land degradation. The data needs to be focused and relevant for further decision making – e.g. for supporting decisions about project design such as project location, technology, mitigation measures.

To establish sufficient knowledge of the project site the assessment should compile the following information through both socio-economic and bio-physical assessments:

a. Defining specific ecosystem of the project site, for example, arid or semi-arid; coastal or freshwater; forest; mountain.

b. Identifying dominant components of the land use system in relation to crop production, biophysical attributes, socio-economic attributes, water resources, forest resources; and the main form of land use: croplands, rangelands, grasslands, forest /woodlands.

c. Identifying key socio-economic information that has impact on land use with respect to, but not exclusively: population growth, development interventions, institutional structures, tenure regimes, livelihood strategies.

d. Developing an understanding of status and trends with respect to: effects of land degradation on livelihoods and socio-cultural services; vegetation and biodiversity status and trends; soil health and erosion status and trends; water resources status and trends; and the effects of land degradation on ecosystem services beyond the projects site.

The analysis should also address planned developments and future land use in the site and the region. Potential data gaps should be identified; in case these constitute critical baseline data needed for the project, recommendations for the collection of these data should be made.

**Task 3. Determination of the potential impacts of the proposed project**

Based on the information sourced above, the assessment should consider the following to measure the impact of any continued/new intervention that may result in land degradation:

a. Identify relevant social and environmental receptors in the project site and assess the potential direct impact(s) of the project on the project site; and whether also potential indirect/induced and cumulative impacts of the project on the receptor should be considered.

b. For each land use type in the project area identify the main causes of degradation considering the following:

* Direct causes: for example bad management practices for soil and rangeland management; deforestation and removal of vegetation, disturbance of water cycle and/or quality.
* Indirect causes: for example population change; week tenure arrangements; inputs and infrastructure.

c. For the above causes assess the level of impact as appropriate in relation to:

* Provisioning services such as food/timber production, water and land availability.
* Regulating services such as hydrology, soil, biodiversity and climate.
* Socio-cultural services: cultural, livelihood security and health.

d. The impacts should then be analyzed on their significance:

* Severity of impact on the receptor –biophysical and socio-economic,
* Duration of impact/seasonal variations,
* Extent of impact (local, regional, national, transboundary, global),
* Reversibility (no, yes, if the latter – to what cost/effort),
* Probability of impact.

Discuss any impact that might cause non-compliance with applicable regulation (laws and regulations, protection status, mandatory standards).

For each significant impact, identify opportunities for mitigation to be explored and analyzed in detail below, but also specify those impacts where no mitigation opportunity exists.

**Task 4. Analysis of alternatives**

The assessment should provide suggestions for project alternatives and opportunities for mitigating impacts which could be through: alternative locations where the negative impact would be less serious; alternative site layout; avoidance of the range of particular species; resource management plans and application of appropriate land use management technologies (such as conservation agriculture, integrated livestock-crop management, agroforestry techniques, sustainable forest management, integrated water resource management).

Details should be provided on cost estimates of the proposed alternatives, their ability to mitigate the impacts, involvement of local communities in the planning and management of land use practices, capacity building needs to implement sustainable land management techniques, legal/policy frameworks that support the interventions, and time frames to implement such work.

**Task 5. Environmental and social management plan**

This part should discuss how to manage the project in order to minimize environmental and social impacts. Provide suggestions for mitigation measures, for monitoring project impacts and assessing the effectiveness of mitigation. Also measures for capacity-building and institutional strengthening should be included in the plan.

**Report**

The ESIA report/statement should be concise and limited to significant environmental and social issues; this should include emerging issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. Unpublished documents used in the assessment may not be readily available and should also be assembled in an appendix. The ESIA report/statement should be organized according to the outlines in FECO Environmental and Social Safeguards Standards-ESIA.

1. Contents taken reference of World Bank Environmental Assessment Sourcebook [↑](#footnote-ref-1)