**Sector Guidelines and Generic TORs for**

**Environmental and Social Impact Assessment**

**Water Resources**

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

Water resource management issues that may emerge in an ESIA are associated with water use or land use decisions that affect the quantity of surface water or groundwater. Changes in quantity may in turn affect the range of uses the particular water resource can support or alter the functions of a natural system dependent on the water.

The project actions which can alter water quantity are discussed here in details.

(1) Environmental Impacts of Increased Runoff

Increases in runoff, result from any activities which make the land surface less permeable, "smoother" or both. The rate of runoff, the total amount of runoff or both may be affected. The impacts include declining water tables, more frequent or more intense flooding, more prolonged or extreme dry weather flows, and scouring or silting of channels. Changes in natural flow patterns can modify or eliminate wetlands and affect agriculture that depends on seasonal flooding for irrigation and maintenance of soil fertility. Where these impacts are predicted, structural and non−structural measures can be incorporated into projects to mitigate them.

(2) Environmental Impacts of Reduced Surface Water Flow

When the overall flow of surface water is reduced significantly by impoundment, diversion, or consumptive use, downstream users and natural systems experience impacts. Two common causes of the flow reductions are growth in the watershed in excess of that which existing water resources can support or overcommitment of water resources from failure to take all uses and users into consideration in project planning. The immediate impacts may include: decline in water quality from diminished dilution of pollutants; seasonal or continuous shortfall in supply for downstream users; reduction in wetland area; and increases in salinity and changes in circulation in estuaries.

Each of these impacts can in turn have secondary impacts, such as decline in shellfish harvests, loss of revenue from water−dependent industry and commerce, or reduced hydroelectric power output. Mitigating measures are few, and most are expensive; relocating industries or importing water from other watersheds are examples. The sound approach is prevention through water resource planning and management on a watershed scale. The terms of reference for the ESIA on any project involving large scale water consumption or diversion should require analysis of existing, planned and projected water availability and use to avoid these impacts from the outset.

(3) Environmental Impacts of Lowered Water Table or Reduction in Artesian Flow

The most obvious impact is the increased cost of drilling deeper wells and pumping water from greater depths. More disruptive is interruption of previously reliable water supply as a result of overpumping from nearby wells or cessation of artesian flow. When the aquifers affected are near the seacoast, saline water may intrude as fresh−water flow diminishes, making coastal wells unusable. Finally, a long−term impact which can occur over a large area and be virtually impossible to reverse is subsidence of the land surface caused by reduced water pressure in unconsolidated rock. Mitigation measures are again few and quite difficult. They involve replacing lost or salt−contaminated groundwater supplies with surface water. Attempts at reversing saline intrusion have met with only limited success. Subsidence may be arrested but is not realistically reversible by any artificial means.

(4) Watershed Planning and Management

Water use and land use are interrelated. Water use decisions in one part of a watershed are likely to pose opportunities and constraints for users in another part. These circumstances argue for integrated planning on a watershed basis, to ensure that the basin's water is not overcommitted, that upstream water users do not deprive those downstream of opportunities, that projects meet their intended purposes, and that patterns and amounts of growth are kept in balance with the capacity of the water resources. Tools and technical knowledge exist to accomplish such planning and management. The difficulties are institutional. Water resources do not respect political boundaries, and there is thus a need for an institution with sufficient capacity and power to influence land and water use decisions in multiple jurisdictions. This frequently entails a corresponding willingness on the part of those jurisdictions to subordinate their authority to the watershed institution. In projects which depend on watershed−wide planning and management, ESIA teams should carefully analyze the institutional structure, the needs for strengthening it, and whether it is politically realistic to anticipate success in the effort.

**Generic Terms of Reference**

These terms of reference will be used when commissioning an assessment of wetland degradation or an assessment of any project where wetlands and water resources may be affected 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 assessing the condition and possible impacts upon wetlands and water resources, with particular experience on, fisheries, hydrology, water quality, plant and animal ecology, social sciences, engineering, economics, and governance (where appropriate), and in addition be conversant with wetlands inventory techniques, land use system analysis and participatory socioeconomic assessment. Expertise in public participation is also 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.

Legal aspects should cover the law and regulations relevant to the project (including e.g. property rights and tenure regimes, registration governing participation and resource management). Political aspects should cover e.g. decision-making process, and current and potential conflicts. The institutional context should refer to the institutional environment (local and central government, private sector and civil society institutions relevant to, and with influence on the project), issues or constraints within existing institutions, and in their relationships with each other.

Sector policies and environmental laws (national, with information on how they relate to international environmental agreements) pertaining to wetlands, rivers, water resources of all kinds should be described, including through mapping where necessary.

**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 wetland 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:

a. Defining specific ecosystem of the project site and around the wetland and water resource areas under consideration, and describing the relations between the wetland area and upland ecosystems and habitats (considers upstream and downstream impacts).

b. Identifying the distribution of ecosystems and habitats, dominant plants and connections between water bodies, wildlife use, fisheries characteristics, and evidence of past disturbances.

c. Identifying wetland functions which provide direct and indirect benefits of value to communities. The assessment should explain what methods were used to assess wetland functions and the strengths and limitations of the methodology applied.

d. 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 wetland use: croplands (e.g. rice farming, flood recession agriculture), rangelands versus fisheries (in e.g. seasonal wetlands), etc.

e. Identifying key socio-economic information that has impact on the use of wetlands, river course and connected areas with respect to, but not exclusively: population growth, development interventions, institutional structures, tenure regimes, and livelihood strategies.

f. developing an understanding of status and trends with respect to: effects of impacts or changes proposed on livelihoods and socio-cultural services; vegetation and biodiversity status and trends; water resources status and trends in water level and flows; and the effects of land degradation in upland ecosystems and habitats on functions and services.

The analysis should also address planned developments and future land use in the site and the region other than the project under consideration. 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**

The impact assessment report should provide detailed information on how wetland functions and values will be adversely affected by the proposed project.

This section of the report should discuss the effects of both direct impacts (e.g. filling, dredging, clearing, alterations to wetland hydrology, and bad management) as well as indirect impacts (population growth, increased intrusion, increased noise, infrastructure nearby – both upstream and downstream, etc.) on wetlands and water resources.

In addition, potential water quality impacts (e.g. sedimentation, nutrients, hydrocarbons, and toxics) should be identified and highlighted. The report should also assess the level of adverse impacts as appropriate in relation to specific ecosystem services: provisioning services (e.g. food/vegetation/timber production, water and land availability), regulating services (e.g. hydrological, soil, biodiversity and climate) and socio-cultural services (e.g. cultural, livelihood security and health).

The impacts should then be analyzed on their significance as follows:

* 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**

Each of the anticipated impacts noted under the previous section should be addressed here, relative to the effectiveness of the mitigation at replacing lost functions and services.

The assessment should provide broad options for project alternatives and opportunities for eliminating, reducing to acceptable levels, or mitigating impacts, which could be through:

* Selection of alternative project sites to avoid adverse impacts on wetlands and water resources;
* Resource management plans or application of appropriate land/resource use management technologies (e.g. integrated livestock-crop-fisheries management, integrated water resource management);
* Project design features to prevent disruption of, or restore flow patterns and hydrologic regimes critical to maintaining wetlands functions, water resources and peoples’ livelihood;
* Enhance and/or protection of other wetlands in substandard condition to offset losses at the project site;
* Strengthening of institutions to manage and protect wetland, including NGOs;
* Promoting development of national wetland incentives and management strategies.

If any wetland creation, restoration, or enhancement is proposed as compensation, a detailed description of such alternatives should be provided.

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 include information on how the project has been designed to avoid and minimize adverse impacts to wetland areas and water consideration. It should discuss how to manage the project in order to minimize environmental and social impacts, and provide guidelines for long-term environmental and social monitoring to ensure adequate implementation of agreed recommendations. Monitoring should use the findings of the baseline surveys to measure progress regularly. 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)