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ALBANIA COMMUNITY WORKS PROJECT II
OPERATIONAL MANUAL
(ENVIRONMENTAL ASSESSMENT AND LAND ACQUISITION)

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ENVIRONMENTAL ASSESSMENT

The coverage and depth of the Environment Assessment (EA) process depend on the nature, scale and potential impact of a proposed sub-project. It is anticipated that ADF-funded community sub-projects, as a rule, will not trigger a full-scale environmental impact assessment (EIA) process. The EA is broad in scope and takes into account the natural environment as well as human health and socio-cultural aspects, focusing on those issues and potential impacts that are determined as critical for a community based project's environmental soundness and sustainability. The EA runs in parallel with the process of identifying a potential community based sub-project, designing it, and implementing it.

Key considerations to be taken into account during the EA process include:

- Compliance with existing environmental regulations in Albania;
- Linkages with social assessment;
- Analysis of alternatives;
- Public participation and consultation with affected people and organizations; and
- Disclosure of information.

A. Albania Environmental Legislation and Procedures

Activities carried out under the project will conform to current laws in Albania and sound environmental principles. In general sub-projects will not contribute to the degradation of the physical and human environment.

Environmental legislation in Albania is governed by the new Law on Environment Protection No. 8934, dated September 5, 2002. It establishes national and local policies on environmental protection, requirements for the preparation of environmental impact assessments and strategic environmental assessments, requirements for permitting the activities that affect the environment, prevention and reduction of environmental pollution, environmental monitoring and control, duties of the state bodies in relation to environmental issues, role of the public and sanctions imposed on law violators.

According to the new Law on Environmental protection, the Ministry of Environment is the competent authority for reviewing the request and EIA documentation prepared by independent experts hired by the project developer. The law provides that the Ministry will prepare and approve a list of experts to provide such services, but this will be defined in a separate by-act, to be approved by the Council of Ministers

A new draft Law on Environmental Impact Assessment has also been developed based on EU Directives and international practice. In 2001 an EIA and Information Directorate was established in the MoE. Restructuring of the MoE, in 2002 to improve its environmental management system. This has resulted in the establishment of an Environment Inspectorate at central level, and Regional Environmental Agencies (REAs) in each of the 12 Qarks.

The REAs are responsible for the enforcement of environmental legislation at the local level, through local inspectors. This includes the review of proposed construction projects, to

determine their compliance, and monitoring during construction. Without the approval of the respective REA construction projects may not commence. Similarly, the local inspectors have the authority to take action should there be a breach of regulations, including halting work.

Other bodies at Qark/district level with environmental interests comprise:

- Public Health Directorates (PHD): responsible for monitoring drinking water quality.
- Urban Planning Department: for ensuring legal and controlled development that does not harm the environment and landscape.
- Public Enterprises: Water supply services – for connecting the public water supply;
Sanitation services – for connecting the public sewerage network.

These bodies are also required to review and approve construction projects prior to the commencement of construction.

B. Potential Environmental Impacts of Sub-Projects:

The sub-projects include rural roads, water supply, sewerage, lighting, small bridges, small irrigation systems, schools and kindergartens, health centers, community centers, markets, etc.

Mitigating measures that may be adopted for each impact are detailed in the annexes for each of the sub-project types and summarized below. However, as the degree and scope of the impacts will vary according to their type and scope, the mitigating measures may vary too.

Construction and General Impacts

In general the environmental considerations for the construction of each sub-project will include one or more environmental hazards such as health and safety hazards for the construction workers and the public; noise; dust – leading to adverse air quality; soil and/or water pollution from fuel and oil, waste materials, surface run-off, etc; excavation of materials and disposal of surplus soil/earth and other materials, risks to environmentally sensitive areas, flora and fauna, etc. Some sub-projects may also encounter items of cultural value.

As the duration of each sub-project is expected to be no more than 12 months, and the works may not take place in each area at the same time, the beneficiaries may only feel some of the impacts for a short time. However, some short-term impacts may also be long-term, e.g. visual impacts, noise, impacts to environmentally sensitive areas, etc. These effects/risks will be mitigated through measures specific to each sub-project, as suggested below and in the relevant appendices.

Water Supply

Impacts associated with the rehabilitation and construction of water supply systems involve managing the resource in a sustainable manner, to avoid over-utilization and negative impacts on the associated environment, and avoiding contamination of the supply post-treatment. There may also be impacts from the noise of pumps and the disposal of wastewater. Appendix 3.1 summarizes the most typical impacts and measures that may be used to mitigate them.

Rural and Suburban Roads

Impacts associated with the rehabilitation and construction of roads generally include noise, air quality and other such nuisances, vehicle and pedestrian safety, provision of improved drainage and other supporting infrastructure such as retaining walls, etc., and changes in drainage and traffic patterns. Appendix 3.2 summarizes the most typical impacts and measures that may be used to mitigate them.

Small Bridges and Footbridges

In addition to the effects associated with roads, for the bridge approaches, but on a smaller scale, the impacts associated with the rehabilitation and construction of small bridges and footbridges generally center on changes to the river regime and the riverbanks and on aquatic habitats and water quality around the bridge structures and downstream. Appendix 3.3 summarizes the most typical impacts and measures that may be used to mitigate them.

Wastewater, Drainage and Sewerage

Impacts associated with the rehabilitation and construction of sewerage systems will generally focus on any treatment facility that may be provided, notably issues of smell, and the outfall/disposal point. The latter may include effects to the river regime, as described under Bridges (above) environment as well as the effects of pollution by the effluent, especially if inadequately treated. Appendix 3.4 summarizes the most typical impacts and measures that may be used to mitigate them.

Small-Scale Irrigation

Impacts associated with the rehabilitation and construction of irrigation systems will generally be associated with effects on the water resources (see Water Supply, above), water logging of the soil, discharge of the wastewater, especially if to a local watercourse, etc. Appendix 3.5 summarizes the most typical impacts and measures that may be used to mitigate them.

Minor buildings: Health Facilities, Education Facilities, Cultural Centers, Markets, Parks

Impacts associated with the rehabilitation and construction of minor buildings will also be minor, and apart from any sanitation services provided and the disposal of any other wastes generated, they will also be relatively local. In this respect it is particularly important that wastes generated at markets and at health facilities are addressed during sub-project design and monitored during operation. Appendices 3.6-3.7 summarize the most typical impacts and measures that may be used to mitigate them.

C. Institutional Arrangements

Community Works Project II has been assigned category FI (Financial Intermediary) since it involves on-lending or granting of funds for sub-projects, which will be selected after the IDA credit has been approved. For a FI category project, the Bank requires that prior to sub-project approval, the approving authority should verify that the sub-project is in compliance with relevant national and local environmental laws and regulations and is consistent with Bank policy and procedures on environmental assessment, as described in the OP/BP/GP 4.01. In addition, general approval for the procedures and guidelines for environmental compliance, detailed below, will also be sought from the MoE and other concerned authorities.

As in the case of economic, financial, institutional and engineering analysis, EA is a part of project preparation and therefore is the project proponent's responsibility. The actors involved in the EA are the communities, the municipalities, the sub-project designers, ADF - through its district engineers, and the responsible government bodies. As the owners and operators of the completed sub-projects the primary responsibility will lie with the communes and municipalities.

Based on information provided by the beneficiaries each commune/municipality will prepare an EA at the identification (pre-feasibility) stage of each sub-project. The EA will be based on the environmental guidelines provided in the Annexes to this document, and will identify the potential environmental impacts for the sub-project, both positive and negative.

In conjunction with the commune/municipality, as part of the feasibility study for the sub-project, ADF will then carry out a more detailed study. It will further detail the potential impacts on the physical, biological and social environment in and around the sub-project area, and will also suggest possible mitigation measures to be considered by the sub-project designer and the commune/municipality, based on the likely scope, duration and scale of the impacts expected. This document will be given to the designer as part of his/her Terms of Reference, to assist him/her in the design of the sub-project.

As part of the design process the sub-project designer will be required to mitigate any negative environmental impacts arising from the subproject, and to obtain the approval of the commune/municipality and the necessary legal authorities (see Section A). The documents produced will include preparation of an Environmental Mitigation and Monitoring Plan (EMMP) in the format specified in Annex 2. ADF staff will be responsible for monitoring the process to ensure that it complies with the procedures as set out in this manual and, as necessary, will also assist the designer and the commune/municipality in the process.

During both the construction and operational phases of each sub-project the commune/municipality will carry out routine monitoring to ensure that the requirements of the EMMP and any other environmental requirements specified in the legal permits are complied with. It will be assisted by ADF. At each stage there will be particular attention to evaluating the operation and maintenance of the environmental elements of the sub-project, as this will be an important condition for financing further sub-projects in each commune/municipality.

To ensure compliance with procedures and to advise on any further measures required to mitigate impacts as much as possible, ADF will contract a qualified firm or NGO to conduct an annual reviews of a sample of sub-projects and make recommendations accordingly.

ANNEX -1: ENVIRONMENTAL ASSESSMENT AT THE STAGES OF SUB-PROJECT IDENTIFICATION (PRE-FEASIBILITY), FEASIBILITY AND DESIGN COMPLETION

The goals of the environmental assessment (EA) for each sub-project are to:

- Collect evidence that the proposed community based sub-project will not violate existing environmental regulations, except where approved by the appropriate environmental authority;
- Evaluate potential adverse environmental impacts;
- Highlight the need for specific prevention and/or mitigation measures;
- Make recommendations on the type and level of environmental activities at further stages of the sub-project, especially monitoring and mitigating negative impacts.

The steps to be taken are:

- Identification (Pre-feasibility) stage: The beneficiary community and commune/municipality will prepare a preliminary assessment of potential impacts using guidelines provided by ADF.
- Feasibility stage: ADF is responsible for ensuring that the following activities are carried out:
 - A desk study using documentation provided during sub-project identification and supported by other available data.

This will result in a brief report describing the various impacts expected from the sub-project for use during the field assessment. The report will identify any further information to be obtained, information that needs to be confirmed during the field study, investigated in more detail, etc.
 - Visit the sub-project site to carry out a field EA to confirm the information already provided and collect any other information required to carryout the steps detailed below.

This will result in a Feasibility EA along the lines detailed under Results, below. It may include suggestions of possible technical solutions that the designer may adopt to minimize any expected negative impacts and should also determine the need to engage a specialist environmental consultant to carry out a more detailed EA (see Section A and below). Depending on the circumstances this Feasibility EA may be prepared by ADF, the commune/municipality, or a third party. However, in all cases ADF has the responsibility to ensure that the Feasibility EA is of appropriate quality.
- Final design (Design Report) stage: Based on the Feasibility EA the sub-project designer or specialist environmental consultant will prepare his/her own assessment (Design EA), prepare the design of the sub-project or advise the designer as appropriate, and prepare the environmental monitoring and mitigation plan (EMMP). Where appropriate, the latter should be prepared in conjunction with the sub-project designer.

Based on the information provided in the Feasibility EA the contracted sub-project designer or specialist environmental consultant will:

- Make his/her own assessment of the affected environment.
- Investigate any restrictions on the use of land and resources for the sub-project.
- Ensure that the design of the sub-project will minimize negative environmental impacts.
- Check that the sub-project proposal complies with other environmental laws and regulations.
- Estimate the range, scope and scale of the potential environmental impacts.
- Determine the result of the EA as detailed below.
- Make recommendations on the need for specific prevention and/or mitigation measures, through the preparation of an EMMP (see below).
- Prepare the required EMMP.
- Ensure that the sub-project receives the necessary environmental approvals, prior to the commencement of construction.
- As the construction supervisor, ensure that the works are constructed as per the requirements of the EMMP.

The Result of this final EA (Design EA) will be summarized in the designer's Design Report for the sub-project, or, if prepared by a specialist consultant, will be annexed to it. Possible statements are:

- Positive environmental impacts are anticipated.
- No significant adverse environmental impacts are anticipated.
- Possible significant adverse environmental impacts are anticipated.
- The proposed sub-project will violate existing environmental regulations.

The Design EA will be complemented by report and recommendations based on the assessment, including:

- A brief description of the affected environment;
- A brief description of potential impacts;
- Recommendations on:
 - Whether the sub-project should be implemented or not (based on environmental grounds).
 - What specific prevention and/or mitigation measures should be taken during sub-project implementation, if any, including different technical solution(s) construction methods, etc., for design and/or construction, supported by the EMMP.
 - Any further EA and/or public involvement required at other stages of the sub-project.
 - The need for specialist environmental input(s), to prepare a more environmentally appropriate sub-project, and EMMP.

The Commune/Municipality will satisfy itself as to the accuracy and appropriateness of the Design EA, assisted by ADF, and will take action to ensure implementation of the EMMP during the construction/rehabilitation and operation phases of the sub-project.

ANNEX 2: ENVIRONMENTAL MANAGEMENT PLAN FORMAT

A. MITIGATION PLAN

| Phase | Impact | Mitigating Measure | Cost to: | | Institutional Responsibility to: | | Comments (e.g. secondary impacts) |
|-----------------|----------------------------|--------------------|----------|---------|----------------------------------|---------|-----------------------------------|
| | | | Install | Operate | Install | Operate | |
| Construction | • • • • • | | | | | | |
| Operation | • • • • • | | | | | | |
| Decommissioning | • • • • • • | | | | | | |

ANNEX 2: ENVIRONMENTAL MANAGEMENT PLAN FORMAT

B. MONITORING PLAN

| Phase | What parameter is to be monitored? | Where is to be monitored? | How is it to be monitored/ type of monitoring equipment? | When is it to be monitored - frequency or continuous? | Why is the parameter to be monitored (optional)? | Cost to: | | Responsibility to: | |
|--------------|------------------------------------|---------------------------|---|---|--|----------|---------|--------------------|---------|
| | | | | | | Install | Operate | Install | Operate |
| Baseline | | | | | | | | | |
| Construct | | | | | | | | | |
| Operate | | | | | | | | | |
| Decommission | | | | | | | | | |

Appendix 1: Feasibility EA: Desk Study Checklist

As far as possible, this information should be provided by Beneficiaries during sub-project identification. It should be supplemented by information available to ADF from other sources. All the information should be verified during the field appraisal.

Issues of land and resource use, environmental permits and licenses

- What land-use permits required are already in place?
- What material resources will be required, e.g. water, stone, earth, etc.? Specify whether they will be used for construction and/or operation.
- Which resources require permits or licenses (forest use, water use, gravel for road construction etc)? Which permits are already in place?

Sub-project site description

Review the sketch plan provided showing the proposed scope of the sub-project. If no plan has been provided obtain a suitable plan before commencing the study.

- What information is there about current land users/owners – name, contact details, type and extent of use/ownership? What information is missing?
- Does any part of the sub-project site fall under specific environmental regulations, e.g. nature reserve, protected area, national park? Specify.
- Does the project fall under regulations of any other specific law? Specify.

Potential environmental impacts and compliance with environmental regulations

- Describe any disturbances and/or nuisances that may be produced during construction and operation (soil, water resources, flora, fauna, noise, etc).
- Describe any activity that will fall any environmental protection category.
- What wastes will be generated during construction and/or operation? Which of them are toxic or hazardous? What are the estimated quantities and what methods will be used to treat and/or dispose of them, and where?
- What emissions will the sub-project create?
- Will the project create or increase risks of natural or other disasters (landslides, flooding, etc)? Specify the type, likely location and likely conditions under which they will occur.

Relevant Environmental Regulatory Authorities

Review the details of the parties interested in environmental matters provided by the Beneficiaries (name, address, contact). Which other bodies should be added?

- Relevant Local Government Authority/Authorities, including any associated with activities such as gravel extraction, waste disposal. Details of their environmental specialist(s), if present.
- Regional Environmental Authority (REA)
- Public Health Directorate
- Forestry authority; Nature reserve, National park (if applicable)
- Any other environmental protection authority.

Appendix 2: Feasibility EA: Field Study Checklist

This study should be conducted in partnership with the community and the commune/ municipal representatives.

Location

- Check the site plan provided and correct, modify and annotate as required. Include land ownership details as required. Where a plan is not provided obtain a site map, or make a sketch of the site plan and add information as suggested above.
- Mark the location of the site on a map of the local area, indicate the extent of the likely environmental impacts.

Site Survey Questionnaire:

- Who are the community representatives? Names, positions, contact details.
- What are the contact details of others interested in the site – local government, any specialist agencies – environmental and non-environmental?
- What is the approximate area of the site (ha or m²) that will be used for the project activities? Identify permanent and temporary areas separately.
- What is the current use of the site? Provide a brief overview.
- What were its previous uses? Provide dates where possible.
- Describe the physical layout of the site, particularly any major features, e.g., hills, ravines, watercourses, water bodies, flood plains, erosion attributable to water run-off, sensitive habitats - e.g. marshy areas, nature reserves, protected areas, historic landmarks, soils, etc. Which ones change seasonally? Describe the extent and timing of the changes.
Mark the details on the site plan and identify any of the features that could be affected by the proposed sub-project, their likely scope, scale and duration.
- What is known about the geology/hydrogeology beneath the site?
- What services exist on the site – water, sewerage, electricity, telephone? What are their approximate locations?
- Where will construction materials come from/surplus materials be disposed of? Carry out this procedure for areas where there will be a significant impact remote from the sub-project site, e.g., new sites and existing sites where more than 2% of production will be used in the sub-project.
- What special permits or licenses will be required? Who will issue them?
- What are neighbors to the site? E.g., buildings, fields, industries, schools, watercourses. What are their uses? Provide details of the landowners, tenants, etc., and show the extent of their interest. Where possible estimate the distance to/from the site.
- Who else might be affected? When and how? E.g. children walking to/from school, people visiting health centers, elderly people, flora & fauna, transport services. Which ones change seasonally? To what extent?
- What information is there about rare/protected species of fauna and flora (e.g. Red book species)? List protected mammals, birds, fish, reptiles, natural plants and common cultivated plants, present in the area, or those of particular interest. Mark their current habitats, seasonal variations, breeding season, etc. What is/are the risk(s) to these species?

- What are the current uses of water in the site? Give details. How this will change as a result of the sub-project?
- Has the site produced or is the site producing any wastes or effluent? If yes, give details, e.g., how much, when, where it goes to, etc. How will the sub-project change them?
- What facilities/systems are there for the disposal of surface water and/or sewage effluent? What is their capacity? Where are they? How will they need to change as a result of the sub-project?
- How will the sub-project change the landscape significantly (e.g., draining wetland areas, changing water courses)?
- Using the relevant checklist for the sub-project (see Appendices) list the impacts, both positive and negative to be expected or anticipated. Determine their likely timing, duration, scope and scale, and suggest measures that could be taken to monitor and mitigate the negative impacts.

Visual Inspection Procedure

Points to remember whilst on site:

- Visit as much of the site as possible, preferably on foot.
- Mark relevant information on a copy of the site plan provided, as well as making written notes. Include details of the surrounding areas – to determine impacts on neighboring areas and visa versa.
- Take photos of potentially sensitive areas and for general record purposes. Obtain permission first.
- Make notes of any odors, smoke or dust emissions, wastes, etc.

Appendix 3.1 - Check list: Water Supply

| Environmental Components | Possible Impacts | Mitigation Measures |
|-----------------------------|--|--|
| <i>Physical Environment</i> | | |
| Soils | <ul style="list-style-type: none"> • Damage to soil structure due to material storage, construction traffic, etc. • Loss of topsoil during excavation • Effects of excavation for/disposal of soil and other materials • Erosion due to uncontrolled surface run-off and wastewater discharge | <ul style="list-style-type: none"> • Protect non-construction areas, avoid work in sensitive areas during highly adverse conditions, provide temporary haul roads as appropriate, restore damaged areas • Strip topsoil where necessary, store and replace post construction • Design drainage and other disposal facilities to ensure soil stability |
| Land | <ul style="list-style-type: none"> • Damage to land during construction Landslips on embankments, hillsides, etc. • Impacts from excavation for/disposal of soil and other materials | <ul style="list-style-type: none"> • Protect non-construction areas • Design works to minimize land affected • Design slopes & retaining structures to minimize risk, provide appropriate drainage, soil stabilization/vegetation cover • Strip topsoil as necessary and store, replace/reuse post construction • Take/dispose of materials from/at approved sites |
| Water Resources | <ul style="list-style-type: none"> • Over-exploitation, causing changes in resources, flow patterns, etc , with possible impact on downstream users/ users elsewhere (if groundwater) • Interruption of surface and underground drainage patterns during and post construction, creation of standing water Contamination/pollution of resource and/or supply by construction, human and animal wastes, including fuel & oil, hazardous wastes, wastewater, etc | <ul style="list-style-type: none"> • Determine sustainable use/yield (test as required) • Resource planning and management, in conjunction with authorities & communities • Careful design - maintain natural drainage where possible, provide suitable wastewater drainage, safe/sanitary disposal of hazardous wastes • Careful design, adequate protection from/control of livestock; agriculture, casual human contact, hazardous materials - fuel (including storage), etc. |
| Air Quality | <ul style="list-style-type: none"> • Dust and fumes during construction • Impacts from water treatment | <ul style="list-style-type: none"> • Control dust with water, control construction methods and plant, timing of works, vehicle speeds • Minimize major works inside communities • Appropriate design, training in O&M, safety |

| Environmental Components | Possible Impacts | Mitigation Measures |
|---------------------------------|--|---|
| Acoustic Environment | <ul style="list-style-type: none"> • Noise disturbance from construction works, pump stations (if near house/s) | <ul style="list-style-type: none"> • Time work to minimize disturbance • Use appropriate construction methods & equipment • Restrict through-traffic in residential areas • Careful siting and/or design of plant, provide noise barriers e.g. embankments of waste soil |
| <i>Biological Environment</i> | | |
| Natural Habitats | <ul style="list-style-type: none"> • Disturbance of natural habitats from construction, e.g. dust, noise, un-seasonal working, poor siting of new works, disposal of untreated wastes, etc. • Changes in water resources regime | <ul style="list-style-type: none"> • Careful siting, alignment, design of pipelines and structures, and/or timing of works (seasonal) • Select disposal areas and methods carefully Protect sensitive areas within/close to site • Ensure compliance with minimum seasonal flow requirements |
| Fauna and Flora | <ul style="list-style-type: none"> • Loss or degradation during and post construction, especially due to un-seasonal working, changes in environment regimes, etc (see also above) | <ul style="list-style-type: none"> • Careful siting, alignment and/or design to minimize impacts, especially for any sensitive/rare species • Select appropriate construction methods • Protect sensitive areas within/close to site |
| <i>Social Environment</i> | | |
| Aesthetics and Landscape | <ul style="list-style-type: none"> • Local visual impact of completed works and some intrusions into general manmade and natural landscape, loss of trees, vegetation, etc • Noise, dust, wastes, etc., during and post construction | <ul style="list-style-type: none"> • Careful siting and design of works, screening of intrusive items • Replace lost trees, boundary structures, etc , re-vegetate work areas • Careful de-commissioning of construction areas and disposal of wastes • See also Soil, Land, Air Quality and Acoustic |

| Environmental Components | Possible Impacts | Mitigation Measures |
|---------------------------------|--|---|
| Human Health | <ul style="list-style-type: none"> • Health and safety hazards during and post construction • Health impacts and diseases from hazardous construction materials wastes, contaminated water, improper water treatment | <ul style="list-style-type: none"> • Appoint experienced contractors. Incorporate safety and environmental requirements in contract documents. Provide information on mitigating measures. Capacity building to emphasize need for safe working, good supervision, careful planning and scheduling of work activities, involve communities, fence hazardous areas • Correct design and adequate training in O&M of plant, safety procedures, water testing, etc. • Correct disposal of waste |
| Historical/Cultural Sites | <ul style="list-style-type: none"> • Disturbance/damage/degradation to known and undiscovered sites | <ul style="list-style-type: none"> • Careful siting/alignment of works; special measures to protect known resources/areas • Immediately halt work in vicinity of discoveries, pending instructions from relevant authorities |

Appendix 3.2 - Check List: Rural and Suburban Roads

| Environmental Components | Possible Impacts | Mitigation Measures |
|-----------------------------|---|--|
| <i>Physical Environment</i> | | |
| Soils | <ul style="list-style-type: none"> • Damage to soil structure due to material storage, construction traffic, etc. • Loss of topsoil during excavation for/ disposal of construction materials • Erosion due to uncontrolled surface run-off and wastewater discharge | <ul style="list-style-type: none"> • Protect non-construction areas, avoid work in sensitive areas during highly adverse conditions, provide temporary haul roads as appropriate, restore damaged areas • Strip topsoil where necessary, store and replace post construction • Design drainage, structures to ensure soil stability |
| Land | <ul style="list-style-type: none"> • Damage to land during construction Landslips on embankments, hillsides, etc. • Impacts from excavation for/disposal of soil and other materials | <ul style="list-style-type: none"> • Protect non-construction areas • Design works to minimize land affected • Design slopes & retaining structures to minimize risk, provide appropriate drainage and soil stabilization/vegetation cover • Strip topsoil as necessary and store, replace/reuse post construction • Take/dispose of materials from/at approved sites |
| Water Resources | <ul style="list-style-type: none"> • Interruption of surface and underground drainage patterns during and post construction, creation of standing water • Contamination/pollution of resource by construction, human and animal wastes, including hazardous wastes, fuel & oil, wastewater, sediments, etc • Increase in runoff and risk of flooding • Flooding due to clogging of drains and drainage structures, etc. | <ul style="list-style-type: none"> • Careful design, maintain natural drainage where possible, consider alternative alignments • Store hazardous materials and wastes carefully, provide suitable wastewater drainage and safe waste disposal • Mitigate run-off velocities and volumes, provide retention/sedimentation ponds as necessary |
| Air Quality | <ul style="list-style-type: none"> • Dust during and post construction, according to road surface • Traffic fumes during and possible increase post construction | <ul style="list-style-type: none"> • Control dust with water • Control construction methods and plant, timing of works • Restrict vehicle speeds and through-traffic in residential areas, during and post construction • Careful design, especially at hazardous locations |

| Environmental Components | Possible Impacts | Mitigation Measures |
|-------------------------------|---|--|
| Acoustic Environment | <ul style="list-style-type: none"> Noise disturbance from construction works, traffic – speed, quantity and type of traffic during and post construction | <ul style="list-style-type: none"> Time work to minimize disturbance Use appropriate construction methods & equipment Restrict vehicle speeds and through-traffic in residential areas, especially trucks, using signing and appropriate design |
| <i>Biological Environment</i> | | |
| Natural Habitats | <ul style="list-style-type: none"> Disturbance or loss of natural habitats and disturbance of protected areas, during and post construction | <ul style="list-style-type: none"> Careful siting/alignment/placement/design of structures (especially for new roads), and/or timing of works (seasonal) Select disposal areas and methods carefully, Protect sensitive areas within/close to site |
| Fauna and Flora | <ul style="list-style-type: none"> Loss or degradation during and post construction, especially due to un-seasonal working, changes in environmental regimes, e.g. disruption to wildlife movements causing increased road kills, etc (see also above) | <ul style="list-style-type: none"> Careful siting and/or design to minimize impacts, especially for sensitive/rare species Consider alternative alignments and/or location of structures Select appropriate construction methods Protect sensitive areas within/close to site Work seasonally, as appropriate |
| <i>Social Environment</i> | | |
| Aesthetics and Landscape | <ul style="list-style-type: none"> Local visual impact of completed works and some intrusions into general manmade and natural landscape, loss of trees, vegetation, etc. Noise, dust, wastes, etc during and post construction | <ul style="list-style-type: none"> Careful siting and design of works, screening of intrusive items Replace lost trees, boundary structures, etc., re-vegetate work areas Careful de-commissioning and reinstatement of construction areas, and disposal of wastes See also Soil, Land, Air Quality and Acoustic |

| Environmental Components | Possible Impacts | Mitigation Measures |
|---------------------------------|---|--|
| Human Health | <ul style="list-style-type: none"> • Health and safety hazards during and post construction • Health impacts from hazardous construction materials and wastes, pedestrian and vehicle accidents, • transport of hazardous substances | <ul style="list-style-type: none"> • Appoint experienced contractors. Incorporate safety and environmental requirements in contract documents. Provide information on mitigating measures. Capacity building to emphasize need for safe working, good supervision, careful planning and scheduling of work activities, involve communities, fence hazardous areas • Correct disposal of wastes • Correct design, including safety measures at hazard points, fencing, road signs, etc. • Restrict movement of hazardous materials in residential areas |
| Human Communities | <ul style="list-style-type: none"> • Social change (new roads) | <ul style="list-style-type: none"> • Appropriate design to minimize social impact (see generally above) |
| Historical/Cultural Sites | <ul style="list-style-type: none"> • Disturbance/damage/degradation to known and undiscovered sites | <ul style="list-style-type: none"> • Careful siting/alignment of works; special measures to protect known resources/areas • Immediately halt work in vicinity of discoveries, pending instructions from relevant authorities |

Appendix 3.3 - Check List: Small Bridges and Footbridges

| Environmental Components | Possible Impacts | Mitigation Measures |
|-----------------------------|--|---|
| <i>Physical Environment</i> | | |
| Soils | <ul style="list-style-type: none"> • Damage to soil structure due to material storage, construction traffic, etc. • Loss of topsoil during excavation for/ disposal of construction materials • Erosion due to uncontrolled surface run-off • Degradation of riverbanks and bed post construction, especially through changed hydraulics and flow patterns and erosion | <ul style="list-style-type: none"> • Protect non-construction areas, avoid work in sensitive areas during highly adverse conditions, provide temporary haul roads as appropriate, restore damaged areas • Strip topsoil where necessary, store and replace post construction • Design drainage and other disposal facilities to ensure soil stability • Careful design of abutments, piers and protecting works |
| Land | <ul style="list-style-type: none"> • Damage to land during construction Landslips on embankments, hillsides, etc. • Impacts from excavation for/disposal of soil and other materials | <ul style="list-style-type: none"> • Protect non-construction areas • Design works to minimize land affected • Design slopes & retaining structures to minimize risk, provide appropriate drainage and soil stabilization/vegetation cover • Strip topsoil as necessary and store, replace/reuse post construction • Take/dispose of materials from/at approved sites |
| Water Resources | <ul style="list-style-type: none"> • Interruption of surface and underground drainage patterns during and post construction, creation of standing water • Contamination/pollution of resource by construction, human and animal wastes, including hazardous wastes, fuel & oil, wastewater, sediments, etc | <ul style="list-style-type: none"> • Careful design, maintain natural drainage and river flow patterns wherever possible, consider alternative alignments and structures • Store hazardous materials and wastes carefully, provide suitable drainage and safe waste disposal • Where possible execute construction during dry season • Mitigate run-off velocities and volumes, design outfalls accordingly |
| Air Quality | <ul style="list-style-type: none"> • Dust and fumes during construction • Traffic fumes post construction (for road bridge) | <ul style="list-style-type: none"> • Control dust with water • Control construction methods and plant, timing of works • Restrict vehicle speeds in residential areas • Appropriate design |

| Environmental Components | Possible Impacts | Mitigation Measures |
|---------------------------------|--|--|
| Acoustic Environment | <ul style="list-style-type: none"> • Noise disturbance from construction works and traffic during and post construction – speed, quantity and type (for road bridge) | <ul style="list-style-type: none"> • Time work to minimize disturbance • Use appropriate construction methods & equipment • Restrict vehicle speeds in residential areas, especially trucks, using signing and appropriate design |
| <i>Biological Environment</i> | | |
| Natural Habitats | <ul style="list-style-type: none"> • Disturbance or loss of natural habitats during and post construction (especially aquatic), due to hydraulics, changed flow patterns, etc. • Disturbance of protected areas | <ul style="list-style-type: none"> • Careful siting/alignment/ design (especially for new bridges), and/or timing of works (seasonal) • Select disposal areas and methods carefully, Protect sensitive areas within/close to site |
| Fauna and Flora | <ul style="list-style-type: none"> • Loss or degradation during and post construction, especially due to un-seasonal working, changes in environmental regimes, e.g. disruption to fish spawning sites, to wildlife movements (approach roads), etc. (see also above) | <ul style="list-style-type: none"> • Careful siting and/or design to minimize impacts, especially for sensitive/rare species • Consider alternative alignments and/or location of structures • Select appropriate construction methods • Protect sensitive areas within/close to site • Work seasonally, as appropriate |
| <i>Social Environment</i> | | |
| Aesthetics and Landscape | <ul style="list-style-type: none"> • Local visual impact of completed works and some intrusions into general manmade and natural landscape, loss of trees, vegetation, etc. • Noise, dust, wastes, etc., during and post construction | <ul style="list-style-type: none"> • Careful siting and design of works, screening of intrusive items • Replace lost trees, boundary structures, etc., re-vegetate work areas • Careful de-commissioning and reinstatement of construction areas, and disposal of wastes • See also Soil, Land, Air Quality and Acoustic |

| Environmental Components | Possible Impacts | Mitigation Measures |
|---------------------------|--|--|
| Human Health | <ul style="list-style-type: none"> • Health and safety hazards during and post construction • Health impacts from hazardous construction materials and wastes, pedestrian and vehicle accidents (for road bridges), • Transport of hazardous substances | <ul style="list-style-type: none"> • Appoint experienced contractors. Incorporate safety and environmental requirements in contract documents. Provide information on mitigating measures. Capacity building to emphasize need for safe working, good supervision, careful planning and scheduling of work activities, involve communities, fence hazardous areas • Correct disposal of wastes • Correct design, including safety measures at hazard points - especially pedestrian/vehicle interaction, e.g. fencing, barriers, road signs, etc • Restrict movement of hazardous materials, in residential areas, apply any load restrictions required during and post construction |
| Historical/Cultural Sites | <ul style="list-style-type: none"> • Disturbance/damage/degradation to known and undiscovered sites | <ul style="list-style-type: none"> • Careful siting and alignment of works, special measures to protect known resources/areas • Immediately halt work in vicinity of discoveries, pending instructions from relevant authorities |

Appendix 3.4 - Check List: Wastewater, Drainage and Sewerage

| Environmental Components | Possible Impacts | Mitigation Measures |
|-----------------------------|--|--|
| <i>Physical Environment</i> | | |
| Soils | <ul style="list-style-type: none"> • Damage to soil structure due to material storage, construction traffic, etc. • Loss of topsoil during excavation for/ disposal of construction materials • Erosion due to uncontrolled surface run-off • Pollution at discharge point, possibly leading to groundwater pollution | <ul style="list-style-type: none"> • Protect non-construction areas, avoid work in sensitive areas during highly adverse conditions, provide temporary haul roads as appropriate, restore damaged areas • Strip topsoil where necessary, store and replace post construction • Design drainage and other disposal facilities to ensure soil stability and appropriate treatment |
| Land | <ul style="list-style-type: none"> • Landslips on embankments, hillsides, etc. • Impacts from excavation for/disposal of soil and other materials | <ul style="list-style-type: none"> • Protect non-construction areas • Design works to minimize land affected • Design slopes & retaining structures to minimize risk, provide appropriate drainage and vegetation cover • Strip topsoil as necessary and store, replace/reuse post construction • Take/dispose of materials from/at approved sites |
| Water Resources | <ul style="list-style-type: none"> • Changes in regime from excavation for/disposal of soil, waste materials, etc • Contamination/pollution from construction, human and animal wastes, including fuel & oil, hazardous wastes, wastewater and sewage – especially from discharge if not connected to existing sewer • Eutrophication of surface water leading to habit changes, etc. | <ul style="list-style-type: none"> • Store hazardous materials and wastes carefully, provide suitable wastewater drainage and safe waste disposal • Select appropriate technology for wastewater treatment to minimize pollution, especially in sensitive locations, e.g. close to drinking water source, and operate and maintain correctly/ according to agreed discharge standards provide O&M training • Site treatment works appropriately, or incorporate into larger wastewater systems, provide any treatment necessary to meet required standards, plus training |

| Environmental Components | Possible Impacts | Mitigation Measures |
|-------------------------------|--|--|
| Air Quality | <ul style="list-style-type: none"> • Dust and fumes during construction • Hazardous gases in manholes and during disinfection (if chlorine gas) | <ul style="list-style-type: none"> • Control dust with water • Control construction methods and plant, timing of works • Restrict vehicle speeds in residential areas • Appropriate design • Proper operation, monitoring system in place |
| Acoustic Environment | <ul style="list-style-type: none"> • Noise disturbance from construction works and traffic | <ul style="list-style-type: none"> • Time work to minimize disturbance • Use appropriate construction methods & equipment • Restrict vehicle speeds in residential areas, especially trucks |
| <i>Biological Environment</i> | | |
| Natural Habitats | <ul style="list-style-type: none"> • Disturbance or loss of natural habitats and disturbance of protected areas, during and post construction • Changes due to eutrophication of surface water | <ul style="list-style-type: none"> • Careful siting/design of structures and/or timing of works (seasonal) • Select disposal areas and methods carefully, Protect sensitive areas within/close to site |
| Fauna and Flora | <ul style="list-style-type: none"> • Disturbance or loss, especially aquatic animals and vegetation from eutrophication of surface water, (effect of water pollution) | <ul style="list-style-type: none"> • Careful siting, alignment and/or design to minimize impacts, especially for any sensitive/rare species • Select appropriate construction methods • Protect sensitive areas within/close to site • Abatement of pollution by a proper effluent treatment and disposal. |
| <i>Social Environment</i> | | |
| Aesthetics and Landscape | <ul style="list-style-type: none"> • Local visual impact of completed works and some intrusions in general manmade and natural landscape, loss of trees, vegetation, etc. • Noise, dust, wastes, etc , during and post construction • Unpleasant odors from treatment facility, disposal point and/or polluted water course | <ul style="list-style-type: none"> • Careful siting and design of works, screening of intrusive items • Replace lost trees, boundary structures, etc , re-vegetate work areas • Careful de-commissioning and reinstatement of construction areas, and disposal of wastes during and post construction, including proper O&M of treatment facility and training in both • See also Soil, Land, Air Quality and Acoustic |

| Environmental Components | Possible Impacts | Mitigation Measures |
|---------------------------------|---|--|
| Human Health | <ul style="list-style-type: none"> • Health and safety hazards during and post construction • Health impacts from hazardous construction materials and untreated wastes | <ul style="list-style-type: none"> • Appoint experienced contractors • Incorporate safety and environmental requirements in contract documents. Provide information on mitigating measures. Capacity building to emphasize need for safe working, good supervision, careful planning and scheduling of work and O&M activities, involve communities, fence hazardous areas • Careful siting and design of works • Correct disposal of wastes, based on selection of most appropriate technology; training in O&M operation and maintenance plans |
| Human Communities | <ul style="list-style-type: none"> • Impacts may be concentrated downstream in other communities | <ul style="list-style-type: none"> • Adequate treatment prior to discharge • Adequate consultation of potentially affected communities |
| Historical/Cultural Sites | <ul style="list-style-type: none"> • Disturbance/damage/degradation to known and undiscovered sites | <ul style="list-style-type: none"> • Careful siting/alignment of works; special measures to protect known resources/areas • Immediately halt work in vicinity of discoveries, pending instructions from relevant authorities |

Appendix 3.5 - Check List: Small-Scale Irrigation

| Environmental Components | Possible Impacts | Mitigation Measures |
|-----------------------------|--|--|
| <i>Physical Environment</i> | | |
| Soils | <ul style="list-style-type: none"> • Damage to soil structure due to material storage, construction traffic, etc. • Loss of topsoil during Excavation for/ disposal of construction materials • Erosion due to uncontrolled surface run-off • Degradation of riverbanks and bed, post construction, especially through changed hydraulics and flow patterns and erosion (river intake) Soil water-logging from improper drainage, pollution through improper use/storage of agro-chemicals | <ul style="list-style-type: none"> • Protect non-construction areas, avoid work in sensitive areas during highly adverse conditions, provide temporary haul roads as appropriate, restore damaged areas • Strip topsoil where necessary, store and replace post construction • Design drainage and other disposal facilities to ensure soil stability • Careful siting ; training in crop selection and agricultural technology; • Careful design and appropriate selection of irrigation and drainage systems |
| Land | <ul style="list-style-type: none"> • Damage to land during construction Landslips on embankments, hillsides, etc • Impacts of excavation for/disposal of soil, waste materials, etc | <ul style="list-style-type: none"> • Protect non-construction areas • Design works to minimize land affected • Design slopes & retaining structures to minimize risk, provide appropriate drainage and soil stabilization/vegetation cover • Strip topsoil as necessary and store, replace/reuse post construction • Take/dispose of materials from/at approved sites |
| Water Resources | <ul style="list-style-type: none"> • Over-exploitation, causing changes in resources, flow patterns, etc., with possible impact on downstream users/ users elsewhere (if groundwater) • Interruption of surface and underground drainage patterns during and post construction, creation of standing water where inappropriate • Contamination/pollution of resource by construction wastes, including hazardous wastes, fuel & oil, wastewater, sediments and agro-chemicals, etc., • Clogging of canals/channels from weeds, sediments, etc., causing flooding, changes in habitats, etc. • De-oxygenation, eutrophication and other degradation of receiving water | <ul style="list-style-type: none"> • Determine sustainable use/yield (test as required) • Plan use and management of resource in conjunction with authorities & communities • Careful design of works, maintain natural drainage where possible, consider alternative alignments • Store hazardous materials and wastes carefully, provide suitable wastewater drainage and safe waste disposal • Mitigate run-off velocities and volumes • Control of agrochemical use • Proper O&M, and training for both |

| Environmental Components | Possible Impacts | Mitigation Measures |
|---------------------------------|---|---|
| Air Quality | <ul style="list-style-type: none"> Dust and fumes during construction | <ul style="list-style-type: none"> Control dust with water, control construction methods and plant, timing of works, vehicle speeds |
| Acoustic Environment | <ul style="list-style-type: none"> Noise disturbance from construction works and traffic, pump stations (if near house/s) | <ul style="list-style-type: none"> Time work to minimize disturbance Use appropriate construction methods & equipment, restrict traffic movements as appropriate Careful siting and/or design of plant, provide noise barriers e.g. embankments of waste soil |
| <i>Biological Environment</i> | | |
| Natural Habitats | <ul style="list-style-type: none"> Disturbance of natural habitats by construction, e.g dust, noise, un-seasonal working, poor siting of new works, disposal of untreated wastes, etc Changes in water resources (see above) | <ul style="list-style-type: none"> Careful/alternative siting, alignment, design of pipelines, canals, structures, etc., timing of works (seasonal) and/or crop selection Select disposal areas and methods carefully Protect sensitive areas within/close to site Ensure compliance with minimum seasonal flow requirements |
| Fauna and Flora | <ul style="list-style-type: none"> Loss or degradation during and post construction, especially due to un-seasonal working, changes in environmental regimes, etc (see also above) Algae blooms, proliferation of aquatic weeds | <ul style="list-style-type: none"> Careful siting, alignment and/or design to minimize impacts, especially for any sensitive/rare species Select appropriate construction methods Protect sensitive areas within/close to site Provide corridors for movement of animals |
| <i>Social Environment</i> | | |
| Aesthetics and Landscape | <ul style="list-style-type: none"> Local visual impact of parts of completed works and some intrusions in landscape, loss of trees, vegetation, etc. Noise, dust, wastes, etc., during and post construction | <ul style="list-style-type: none"> Careful siting and design of works, screening of intrusive items Replace lost trees, boundary structures, etc., re-vegetate work areas Careful de-commissioning of construction areas and disposal of wastes See also Soil, Land, Air Quality and Acoustic |

| Environmental Components | Possible Impacts | Mitigation Measures |
|---------------------------------|--|---|
| Human Health | <ul style="list-style-type: none"> • Health and safety hazards during and post construction • Health impacts from human and animal wastes in irrigation waters, especially if used on salads, etc. • Toxicity of agro-chemicals | <ul style="list-style-type: none"> • Appoint experienced contractors. Incorporate safety and environmental requirements in contract documents. Provide information on mitigating measures. Capacity building to emphasize need for safe working, good supervision, careful planning and scheduling of work activities, involve communities, fence hazardous areas • Correct disposal of wastes • Education in proper sanitation and health practices, good O&M; control of animals careful storage and management of agro-chemicals, integrated pest management (IPM) programs |
| Human Communities | <ul style="list-style-type: none"> • Unequal distribution of water | <ul style="list-style-type: none"> • Community participation to agree management regime |
| Historical/Cultural Sites | <ul style="list-style-type: none"> • Disturbance/damage/degradation to known and undiscovered sites | <ul style="list-style-type: none"> • Careful siting and alignment of works; special measures to protect known resources/areas • Immediately halt work in vicinity of discoveries, pending instructions from relevant authorities |

Appendix 3.6 - Check list: Education Facilities/Community Centers/Markets/Parks

| Environmental Components | Possible Impacts | Mitigation Measures |
|---|--|---|
| <i>Physical Environment</i> | | |
| Soils | <ul style="list-style-type: none"> Contamination from waste materials, especially construction and human wastes | <ul style="list-style-type: none"> Protect non-construction areas Provide adequate storage, and appropriate treatment and disposal of all wastes |
| Land | <ul style="list-style-type: none"> Landslips on embankments, hillsides, etc. Impacts from excavation for/disposal of soil and other materials | <ul style="list-style-type: none"> Protect non-construction areas Design works to minimize land affected Design slopes & retaining structures to minimize risk, provide appropriate drainage and vegetation cover Strip topsoil as necessary and store, replace/reuse post construction Take/dispose of materials from/at approved sites |
| Water Resources | <ul style="list-style-type: none"> Contamination/pollution of resource by construction, human and animal wastes, including fuel & oil, hazardous wastes, wastewater, etc. | <ul style="list-style-type: none"> Store hazardous materials and wastes carefully, provide suitable wastewater drainage and safe waste disposal, with treatment as necessary |
| Air Quality | <ul style="list-style-type: none"> Dust and fumes during construction (internal and/or external, including volatile construction materials) | <ul style="list-style-type: none"> Dust control by water or otherwise Ventilation of internal areas both during and post construction |
| Acoustic Environment | <ul style="list-style-type: none"> Noise disturbance from construction | <ul style="list-style-type: none"> Use appropriate construction methods & equipment Time work to minimize disturbance |
| <ul style="list-style-type: none"> <i>Biological Environment</i> | | |
| Natural Habitats | <ul style="list-style-type: none"> Disturbance of natural habitats, especially from improper waste disposal | <ul style="list-style-type: none"> Store, treat and dispose of wastes appropriately |
| Fauna and Flora | <ul style="list-style-type: none"> Loss or degradation due to improper waste disposal | <ul style="list-style-type: none"> Store, treat and dispose of wastes appropriately |

| Environmental Components | Possible Impacts | Mitigation Measures |
|---------------------------|---|--|
| <i>Social Environment</i> | • | • |
| Aesthetics and Landscape | <ul style="list-style-type: none"> • Local visual impact of parts of completed works and some intrusions in landscape, loss of trees, vegetation, etc. • Noise, dust, wastes, etc., during and post construction | <ul style="list-style-type: none"> • Careful siting and design of works, screening of intrusive items • Replace lost trees, boundary structures, etc , re-vegetate work areas • Careful de-commissioning of construction areas and disposal of wastes • See also Soil, Land, Air Quality and Acoustic |
| Human Health | <ul style="list-style-type: none"> • Health and safety hazards during and post construction, including patient access and comfort and handling of medical wastes • Health impacts from hazardous construction materials, medical services – equipment, drugs, wastes, etc., and untreated wastes, especially medical wastes | <ul style="list-style-type: none"> • Appoint experienced contractors. Incorporate safety and environmental requirements in contract documents. Provide information on mitigating measures Capacity building to emphasize need for safe working, good supervision, careful planning and scheduling of work and O&M activities, involve communities, fence hazardous areas • Careful design of works and accesses • Correct storage of medical items, etc., and careful disposal of wastes, based on selection of most appropriate technology, training in handling, O&M plans, etc |
| Historical/Cultural Sites | <ul style="list-style-type: none"> • Disturbance/damage/degradation to undiscovered sites | <ul style="list-style-type: none"> • Immediately halt work in vicinity of discoveries, pending instructions from relevant authorities and agreed actions |

Appendix 3.7 - Check list: Health Facilities

| Environmental Components | Possible Impacts | Mitigation Measures |
|---|---|---|
| <i>Physical Environment</i> | | |
| Soils | <ul style="list-style-type: none"> Contamination from waste materials, especially construction, medical and human wastes | <ul style="list-style-type: none"> Protect non-construction areas Provide adequate storage, and appropriate treatment and disposal of all wastes |
| Land | <ul style="list-style-type: none"> Landslips on embankments, hillsides, etc. Impacts from excavation for/disposal of soil and other materials | <ul style="list-style-type: none"> Protect non-construction areas Design works to minimize land affected Design slopes & retaining structures to minimize risk, provide appropriate drainage and vegetation cover Strip topsoil as necessary and store, replace/reuse post construction Take/dispose of materials from/at approved sites |
| Water Resources | <ul style="list-style-type: none"> Contamination/pollution of resource by construction, human and animal wastes, including fuel & oil, medical and other hazardous wastes, wastewater, etc | <ul style="list-style-type: none"> Store hazardous materials and wastes carefully, provide suitable wastewater drainage and safe waste disposal, with treatment as necessary |
| Air Quality | <ul style="list-style-type: none"> Dust and fumes during construction (internal and/or external, including volatile construction materials) Odor, post construction, according to services offered, etc | <ul style="list-style-type: none"> Dust control by water or otherwise Ventilation of internal areas both during and post construction Careful design and siting of facilities that will cause odors |
| Acoustic Environment | <ul style="list-style-type: none"> Noise disturbance from construction | <ul style="list-style-type: none"> Use appropriate construction methods & equipment Time work to minimize disturbance |
| <ul style="list-style-type: none"> <i>Biological Environment</i> | | |
| Natural Habitats | <ul style="list-style-type: none"> Disturbance of natural habitats, especially from improper waste disposal | <ul style="list-style-type: none"> Store, treat and dispose of wastes appropriately |
| Fauna and Flora | <ul style="list-style-type: none"> Loss or degradation due to improper waste disposal | <ul style="list-style-type: none"> Store, treat and dispose of wastes appropriately |

| Environmental Components | Possible Impacts | Mitigation Measures |
|---------------------------|--|---|
| <i>Social Environment</i> | | |
| Aesthetics and Landscape | <ul style="list-style-type: none"> • Local visual impact of parts of completed works and some intrusions in landscape, loss of trees, vegetation, etc • Noise, dust, wastes, etc., during and post construction | <ul style="list-style-type: none"> • Careful siting and design of works, screening of intrusive items • Replace lost trees, boundary structures, etc., re-vegetate work areas • Careful de-commissioning of construction areas and disposal of wastes • See also Soil, Land, Air Quality and Acoustic |
| Human Health | <ul style="list-style-type: none"> • Health and safety hazards during and post construction, including patient access and comfort • Health impacts from hazardous construction materials and untreated wastes, especially medical wastes | <ul style="list-style-type: none"> • Appoint experienced contractors. Incorporate safety and environmental requirements in contract documents. Provide information on mitigating measures. Capacity building to emphasize need for safe working, good supervision, careful planning and scheduling of work and O&M activities, involve communities, fence hazardous areas • Careful design of works and accesses • Correct disposal of wastes, especially medical wastes, based on selection of most appropriate technology, training in O&M operation and maintenance plans |
| Historical/Cultural Sites | <ul style="list-style-type: none"> • Disturbance/damage/degradation to undiscovered sites | <ul style="list-style-type: none"> • Immediately halt work in vicinity of discoveries, pending instructions from relevant authorities and agreed actions |

POLICY FRAMEWORK TO ADDRESS POTENTIAL MINOR IMPACT RELATED TO LAND ACQUISITION ISSUES

Amount of Land to be Acquired

In a few sub-projects, land may need to be acquired for civil works, for e.g., building septic tanks or reservoirs or, for accessing water sources. However, the size of land required for these is generally small, say, 3-400 square meters per construction activity. It is also clear from the experience of CWP I Project that land-for-land has been the mode of compensation, as opposed to cash compensations. It is not expected that households will lose more than 10% of their plots, should there be land acquisition in a sub-project.

Monitoring of the Land Acquisition Process

All compensation issues related to loss of land should be resolved before the start of civil works, and should be legally binding. Agreements on land and compensation will be reached between people losing land and the Commune/Municipality. Copies of these agreements should be provided to the ADF by the Commune/Municipality and the concerned commune/municipality is required to take necessary action in the event of any land related problems during implementation.

During project implementation, the land acquisition process will be carefully documented by ADF. For example, in addition to keeping on file, copies of agreements between affected people and the Commune/Municipality, ADF will maintain a summary matrix that is periodically updated, which lists owners, the sizes of the plots affected, the amount of land expropriated (physical size and percent of the whole plot), the amount and location of alternative land that was provided to the owner, or the amount of cash compensation and records of any court suits and settlement amounts (if they differ from the initial compensation). ADF will also periodically undertake supervision to ensure people affected by land acquisition are being appropriately compensated, through land or cash. This aspect of the project will also be supervised carefully by the Bank project team twice a year during the first two years, and annually thereafter.

Removal of Secondary Encroachments from Rights-of-Way

In order to remove any secondary claims on the Right of Way (for example, fences, kiosks etc) that may obstruct the implementation of the maintenance work, sufficient advance legal notice should be provided by the Commune/Municipalities/contractors, to the residents. However, despite the advance notice, if structures continue to remain intact, such sub-projects shall not be included for rehabilitation. There will be no forced removal of secondary claims so that civil works may be completed. This fact shall also be specified in the technical specifications to the contractor from the Municipalities/ Communes.

Mitigation Measures

The following matrix provides details on the scope of work in a sub-project that may cause (i) minor land acquisition (less than 10% of individual owner's holdings), and/or (ii) restrictions such as temporary loss of access to land, trees or other resources. Additionally, the matrix provides guidelines on the mitigation measures that contractors need to provide in the event of occurrence of such minor negative impacts.

ANNEX 3: POLICY FRAMEWORK MATRIX TO ADDRESS POTENTIAL MINOR IMPACT RELATED TO LAND ACQUISITION

A. Minor Land Acquisition Impact in Water Supply Projects and Mitigating Measures

| Item of Work | Scope of Work | Potential Adverse Physical or Social Impacts | Recommended Mitigation Measures |
|---|---|--|--|
| Source Reservoir and water treatment Secondary Pumping Station | Structure to capture of water via spring; well; tube-well or surface water source Construct reservoir Locate/construct pumping station according to needs | Loss of land Loss of direct access to water by owner Loss of trees and vegetation Possible marginal loss of harvest Periodic access for maintenance or repairs | Construct items in public land. Adjust design to minimize adverse impact on private land. Where not possible, Commune/Municipality to negotiate, and arrange appropriate compensation (usually land-for-land). Reinstate items lost or damaged during construction, e.g trees and maintenance repairs Postpone the period of the works out of the season of harvest. Create additional water intake allowing the owner of the land to take water for his own. Sign agreement with the land owner to allow for periodic interventions for maintenance and repairs |
| Transmission main(s) Distribution network, manholes, connection points | Excavation of trenches for pipes, valve chambers, washout points, household connections | Pipes may need to cross private land – temporary damage to land, trees, fences, etc. Periodic access for maintenance and repairs | Reinstate lost items during construction Appropriate design to avoid/minimize impact Dispose off excess materials Sign agreement for periodic access with the concerned land owners |

B. Minor Land Acquisition Impact in Sewerage/Drainage Network Projects and Mitigating Measures

| Item of Work | Scope of Work | Potential Adverse Physical or Social Impacts | Recommended Mitigation Measures |
|--|--|--|--|
| Collector network, manholes, connection points Trunk sewers | Excavation of trenches for pipes, manholes, facilities for household connections | May need to cross private land – temporary minor damage to land, trees, fences, roads, etc Periodic access for maintenance or repairs | Reinstate/replace items lost or damaged during construction. Appropriate design to avoid/mitigate impact. |
| Pumping Station Treatment Facility Outfall/ discharge point | Construction of pump house, fencing and power supply | Loss of land, trees, etc. Long-term access for maintenance or repairs | Construct items in public land Adjust design to avoid impact on private land. Where not possible, Commune/Municipality to negotiate, and arrange appropriate compensation (usually land-for-land). |

C. Minor Land Acquisition Impact in Road Projects and Mitigating Measures

| Item of Work | Scope of Work | Potential Adverse Physical or Social Impacts | Recommended Mitigation Measures |
|--|--|--|--|
| <p>Carrageway & footpaths</p> <p>Drainage</p> <p>Embankments/ retaining structures</p> | <p>Improvement of existing carrageway including: improved alignment, widening, provision of passing places (on single carrageway road), excavation or filling to raise/lower carrageway, minimise gradients or facilitate alignment, etc.,</p> <p>Rehabilitate existing surface drainage and structures.</p> <p>Build new drains ditches, channels, culverts, etc.</p> | <p>Loss of land, trees, boundary walls, fences, etc.</p> <p>Loss of direct access to property by owner.</p> <p>Removal of encroachments.</p> <p>Discharge of water onto private land</p> | <p>Reinstate/replace items lost or damaged during construction.</p> <p>Appropriate design to avoid/mitigate impact.</p> <p>Keep alignment, etc., e.g. embankments, in public land.</p> <p>If and where carrageway and structures (culverts, walls, embankments, etc) cannot be built in public land, Commune or Municipality to negotiate, and arrange any necessary compensation (usually land-for-land)</p> |
| <p>Statutory services (water, sewerage, telephone, etc.)</p> | | | <p>Rehabilitate existing services as required and as agreed with service provider.</p> |

D. Minor Land Acquisition Impact in Food Bridge and Road Bridge Projects and Mitigating Measures

| Item of Work | Scope of Work | Potential Adverse Physical or Social Impacts | Recommended Mitigation Measures |
|--|---|--|---|
| Approach roads/paths | See Roads Matrix | | |
| Abutments, anchorages, etc. Bank protection | Rehabilitate/enlarge existing abutments. Construct new abutments. Install anchorage works (suspension bridges) Construct protecting works, ranging from walls and revetments to natural materials. | Loss of land, trees, fences, etc. Loss of direct access to property by owner. | Reinstate/replace items lost or damaged during construction Appropriate design to avoid/mitigate impact. Keep within public land. Commune/Municipality to negotiate, and arrange any necessary compensation (usually land-for-land). |