

**LAGOS METROPOLITAN AREA TRANSPORT  
AUTHORITY (LAMATA).**

**PROCEDURAL MANUAL ON ENVIRONMENTAL  
ASSESSMENT**

**PREPARED BY  
ENVIRONMENT/SOCIAL SAFEGUARDS OF LAMATA.**

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## FORWARD

**The environmental assessment manual is designed to facilitate the operations of the Safeguards Unit of the Lagos Metropolitan Area Transport Authority (LAMATA). In the management of environmental issues in the daily operations of the road works and will provide guidance for mainstreaming environmental issues in the activities of the Lagos urban transport project.(LUTP). .**

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## ABBREVIATIONS AND ACRONYMS

BOD -	Biochemical Oxygen Demand
C -	Carbon
CFC -	Chlorofluorocarbons
CH <sub>4</sub> -	Methane
CO -	Carbon MONOXIDE
CO <sub>2</sub> -	CARBON DIOXIDE
COD -	CHEMICAL OXYGEN DEMAND
DB -	Decibel
EA -	Environmental Assessment
EAPs -	Environmental Action Plan
EAR -	Environmental Assessment Report
EMF -	Environmental Management Framework
EMP -	Environmental Management Plan
ESRP -	Environmental and Social Review Procedure
FEPA -	Federal Environmental Protection Agency
FMENV -	Federal Ministry of Environment
FRSC -	Federal Road Safety Corps
IBRD -	International Bank for Reconstruction and Development
ICOMOS -	International Committee of Monuments and Sites
IFC -	International Finance Corporation of the World Bank
IRR -	Internal Rate of Return
IMT -	Intermediate Means of Transport
Km -	Kilometer
LAMATA -	Lagos Metropolitan Area Transport say-so

LGA	-	Local Government Authority
LSFC	-	Lagos State Ferry Services Company
LSG	-	Lagos State Government
LSMT	-	Lagos State Ministry of Transportation
LSMW	-	Lagos State Ministry of Works
LSMWAPA	-	Lagos State Ministry for Women Affairs and Poverty Alleviation
LUTP	-	Lagos Urban Transport Project
MIGA	-	Multilateral Investment Guarantee Agency of the World Bank
MVA	-	Motor Vehicle Administration
NGO	-	Non Governmental Organization
NPTU	-	Nigerian Police Traffic Unit
NO <sub>x</sub>	-	Oxides of Nitrogen
NPV	-	Net Present Value
N <sub>2</sub> O	-	Nitrous Oxide
ODEA	-	Operational Directive on Environmental Assessment
OF	-	Fahrenheit
OMS	-	Operational Manual Statement
O, O <sub>2</sub> , O <sub>3</sub>	-	Oxygen
PHRD	-	Project and Human Resources Development
PRSP	-	Poverty Reduction Strategy Paper
TMU	-	Traffic Management Unit
TSM	-	Traffic System Management
VEC	-	Valued Eco-System Component

## **-SECTION 1**

### **1. INTRODUCTION**

Road projects are generally intended to improve the economic and social welfare of people. Increased road capacity and improved pavements can reduce travel times and lower the costs of vehicle use, while increasing access to markets, jobs, education, and health services and reducing transport costs.

For all the positive aspects of road projects, they may also have significant negative impacts on nearby communities and the natural environment. IF appropriate mitigation measures are not adopted.

#### **1.1 Potential Environmental Impacts of Road Projects**

Direct impacts of road and highway projects result from construction, maintenance, and traffic use. The most significant construction-related impacts are those related to clearing, grading or roadbed construction: loss of vegetative cover, wildlifes,habitats foreclosure of other land uses; modification of natural drainage patterns; changes in groundwater elevation; landslides, erosion, leading stream and lake sedimentation; degradation of vistas or destruction of cultural sites; and interference with movements of wildlife, livestock, and local residents. Many of these impacts can arise not only at the construction site but also at quarries, borrow pits and materials storage areas serving the project. In addition, adverse environmental and socio-cultural impacts can occur in both construction and maintenance projects as a result of air and soil pollution from asphalt plants, dust, noise from construction equipment and blasting; use of pesticides; fuel and oil spills; trash and garbage; and, on large projects, the presence of a non-resident labour force. and impact upon traditional life styles including Aids transmission.

Direct road and highway use impacts may also include: increased demand for motor fuels; accidents with and/or displacement of non-motorized methods of transport; increased air pollution, noise, roadside litter; injury or death to animals and people attempting to cross roadways; health risk and environmental damage from accidents involving hazardous materials in transit; and water pollution from spills or accumulated contaminants on road surfaces.

#### **USE OF MANUAL**

This manual is specially designed for the Safeguard Unit of the Lagos State Metropolitan Area Transport Authority which has as its mandate the responsibility for ensuring that activities with the transport sector fully take account of environmental and social issues.

Specifically, the manual will be used by the environmental section of the safeguard unit of LAMATA whose main objective is to ensure the effective consideration and management of environmental concerns in all aspects of LAMATA's work, from the design, planning, implementation, monitoring and evaluation of transport initiatives in the Lagos Metropolitan Area to the assessment of their impacts.

Apart from the staff of the Safeguard Unit, the procedural manual is designed also for other staff of LAMATA, private sector Consulting Engineers, and Contractors who are directly involved in executing road maintenance and rehabilitation works for LUTP as well as other stakeholders construction, supervising contracts, monitoring and evaluation.

## **1.2 Use**

A major aim of this document is to provide specific guidelines on how to integrate social and environmental concerns associated with road improvement into the planning, design and implementation of road construction rehabilitation and maintenance works of LAMATA in course national, province and district levels... It complements the general Social and Environmental Impact Assessments developed by the Federal Ministry of Environment and the Lagos State Environmental Protection Agency, as well as, the procedural manual on Social Assessment prepared for LUTP. It is neither a legal document nor a book of recipes to be followed mechanically. It is rather, a set of ideas and options from which the Safeguard Unit and other interested parties can choose activities appropriate to their specific conditions. It can be used for monitoring and supervision of major road works such as road should construction and rehabilitation or for small works such as maintenance.

## **1.4 Overview**

The Procedural Manual gives a picture of the emergence environmental policy and management framework for Nigeria at national, district and local levels.. It summarizes some of the main legal landmarks on environment and sustainable development in Nigeria and provides guidance. in linking environmental planning and management with road responsibility and government.

Section 2 details the process of undertaken an environmental assessment for road works. Guidelines on stakeholders participation and consultations are provided in Section3. Federal ministry of environment, Federal highways Department, Federal Ministry of Transport, Federal inland waterways department, Lagos state Ministry of works Lagos state

Ministry of transport ,Lagos state Ministry of Environment ,Lagos state waste Management Authority, Local Government councils NGOS etc.

Section 3 suggests potential stakeholders who should be consulted during various stages of road planning, design and execution of works.

Section 4 outlines road construction improvement types and sources of significance adverse environmental impacts (inputs, activities and outputs) of road construction rehabilitation and maintenance projects.

Section 5 also focuses on possible mitigation measures to address the impacts.

### **1.5 EXISTING Environmental Policy and Management Framework**

The Federal Government of Nigeria established, in 1988, the Federal Environmental Protection Agency vide Decree 58 of 1988 as amended by Decree 59 of 1992 and further amended by Decree 14 of 1999, to protect, restore and preserve the ecosystems of the Federal Republic of Nigeria and establish such environmental criteria, guidelines, specifications of standards as may be necessary to protect the health and welfare of the citizens from environmental degradation.

The Federal Ministry of Environment was established in 1999 to take over the responsibilities of the Federal Environmental Protection Agency.

At the state level, the Lagos State Environmental Protection Agency (LASEPA) was established in 1996 and is charged with the following responsibilities:

- Control of environmental pollution;
- Industrial effluent discharge permitting;
- Laboratory services
- EIA monitoring;
- Management of street trading, illegal markets, sand, late rite and gravel spillage;
- Monitoring of public water safety; and
- Co-coordinating environmental exercises in the State

Some of the other policies and legislative framework that have been put in place to enhance the implementation process for environmental assessment in Nigeria include the following, among others:

- Forestry Act 1958
- Antiquities Act 1958
- Territorial Waters Decree 1967

- Oil in Navigable Waters Decree 1968
- Petroleum Decree 1969
- Quarries Decree 1969
- Sea Fisheries Decree 1971
- Land Use Decree 1978
- National Environmental Protection (Management of Solid and Hazardous Waste) Regulations 1991
- Establishment of Guidelines and Standards for Environmental Pollution Control in Nigeria 1991
- Environmental Impact Assessment Decree 1992
- Water Resources Act 101 of 1993
- Minerals and Mining Act 1999

At the International level, Nigeria is a signatory to a number of conventions which are related to the environment.

Some of these include the following:

- (i) Convention on Biological Diversity 1992
- (ii) Montreal Protocol on Substances that Deplete the Ozone layer.
- (iii) United National Framework Convention on Climate Change (Climate Change Convention), 1992
- (iv) Stockholm Convention on Persistent Organic Pollutants (POPs).

## SECTION 2

### GUIDELINES FOR EXECUTING AN ENVIRONMENTAL ASSESSMENT.

This section of the manual provides an outline of the steps that users may follow to complete an environmental assessment.

The manual further establishes the roles to be played by different actors during the process of environmental analysis and review. There are 5 distinct activities to be performed to complete an environmental appraisal once the roads for Construction Or improvement (rehabilitation/maintenance) have been selected.

- Initial Screening
- Preliminary Environmental Assessment
- Environmental Assessment
- Monitoring
- Evaluation

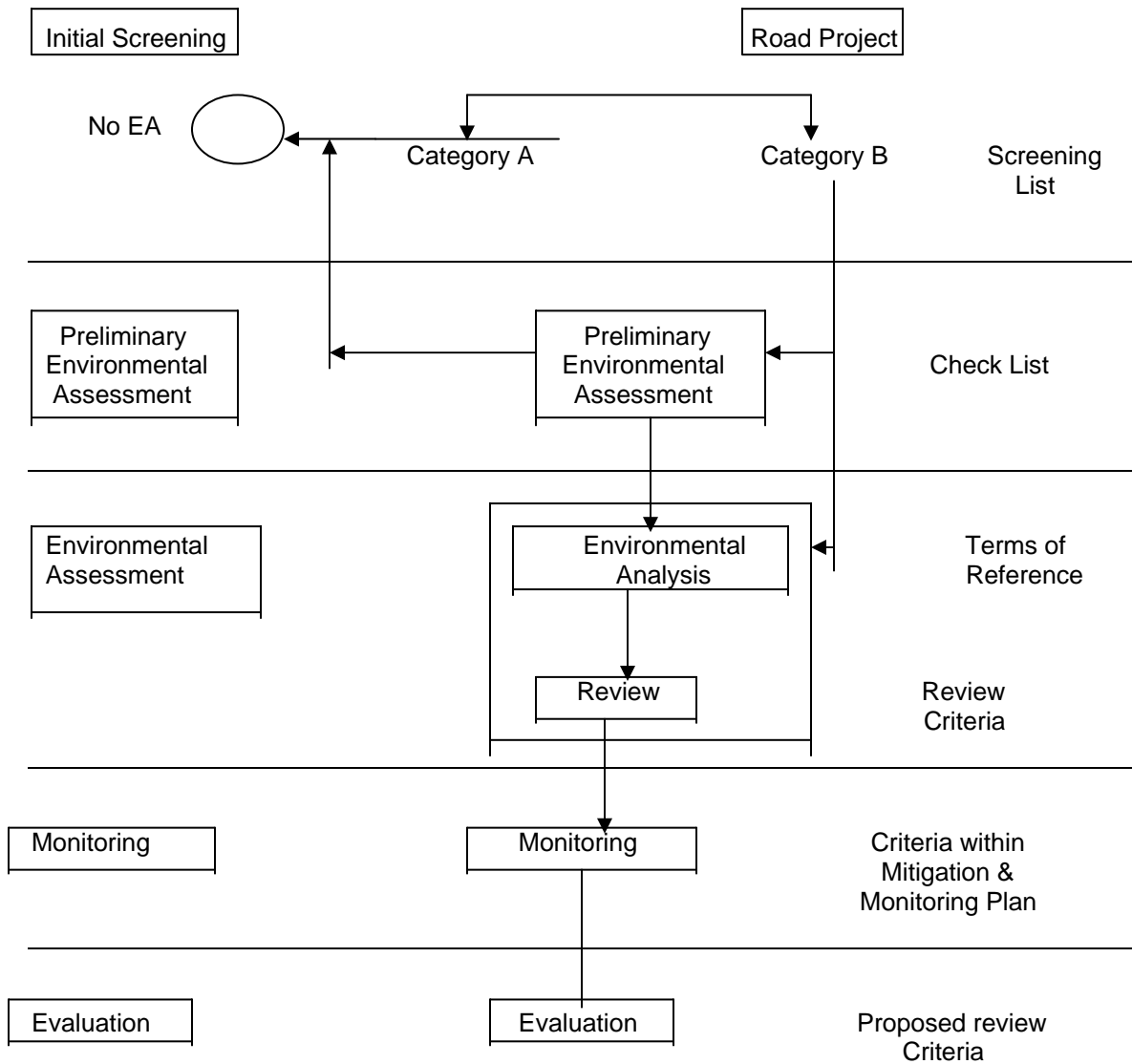
Figure 2.1 presents a schematic representation of the linkages between each activity. Each of these activities is elaborated in the following sub-sections.

#### 2.1 Initial Screening

Initial screening serves two principal purposes:

- (a) to determine which road projects, out of all those proposed at the identification phase of the project cycle, need further environmental consideration, and to eliminate those unlikely to have harmful environmental impacts. This will prevent financial and human resources from being applied to the environmental analysis of projects that are likely to have impacts of little environmental significance.
  - (b) to indicate the level of environmental appraisal that a project will require.
- © To indicate recourse (financing, funding) required for assessment.

Figure 2.1: Schematic Representation of the Environmental Appraisal Processes



### 2.1.1 Tools

Screening lists: These are presented in tables 1 and 2. They are designed for quick and straightforward use; the initial screening process should be completed with a minimal investment of time. The two screening lists identify two categories of road development and improvement projects which indicate whether environmental analysis is required or not.



Category B; Projects that are unlikely to have significant environmental impacts and require no Environmental Analysis.

Category A; Road Projects whose type, scale or other relevant characteristics have potential to cause some significant environmental impacts and hence warrant an Environmental Assessment

### These 1.3 Reference Materials

This procedural manual is based on key environmental assessment documents including the following:

- (i) Environmental Impact Assessment Procedural Guidelines for the Federal Republic of Nigeria, 1995
- (ii) Environmental Impact Assessment Decree 1992
- (iii) National Guidelines on Environmental Management System in Nigeria, 1999
- (iv) National Environmental Protection Management of Solid and Hazardous Wastes Regulations 1991.
- (v) National Guidelines on Waste Disposal Through Underground Injection, 1999
- (vi) Lagos State Government Policy on the Environment, 1997
- (vii) Lagos State Environmental Protection Agency: State of Environment Report, 1997
- (viii) Guidelines and Standard for Environmental Pollution Control in Nigeria.
- (ix) Guidelines for management of solid hazardous waste.

projects require a Preliminary Environmental Assessment or analysis. Projects falling into this category are likely to be large-scale road rehabilitation or new road construction projects.

It should be noted that the Lagos State Urban Transport Project has been defined by the World Bank OP POL 4.01 on EA as category B, which requires “Consequently, a limited environmental analysis is to be conducted as the project may have specified environmental impacts.

### 2.2 Preliminary Environmental Assessment (PEA)

The PEA serves to incorporate into the road improvement planning and design an indication of the range and significance of the potential environmental consequences of a project and to determine the level of further environment analysis of the project that is required.

### 2.2.1 Tools

**Checklist; a check list** covering the most relevant issues to road improvement inputs, activities and outputs are presented in table 3. designed for use with a minimum of specialized technical inputs thus, the Lagos State Urban Transport Project will decide the scope of environmental assessment..

of environmental assessment the questions follow the logical structure of an Environmental Assessment:-

**Sources of Impacts.** Those features or elements of a project that typically cause significant environmental impacts.

**Receptors of Impacts:** Those features or elements of a receiving environment that may be impacted upon by a project.

Table 2.3: Checklist for Road Development and Improvement Projects (Projects in B Category)

Aspects of EIA	Checklist Questions	Yes	No	Additional Data Needs
Sources of Impacts	<b>Will the project</b> 1. Require large volumes of construction materials to be taken from local sources (e.g. gravel, rock, water by dredging, quarrying, tapping etc.)			
	2. Result in significant Quantities of wastes or eroded material dependent upon waste type, season of heavy rainfall)			
	3. Require significant levels of Accommodation or service amenities to support the workforce during construction (e.g. 100 manual workers)			
Receptors of Impacts	4. Be routed such that population resettlement or compensation is required			
	5. Be routed through areas that Support conservation-worthy Ecosystems, flora or fauna (eg Protected areas, wilderness Areas, wetlands, tropical forest, Critical habitats, endangered Species); or sites of historical or cultural importance?			
	6. Be routed across major drainage channels (rivers, canals) or surface water-bodies (lakes, lagoons)?			
Environmental Impacts	7. During construction, lead to reductions in the quality of potable water supplies or cause harm to fish and benthic communities due to the siltation of water-bodies			

	8. Present a danger to local populations due to a significant scale of traffic, e.g. heavy lorries, high frequency, transport at night)			
	9. Create barriers to the movement conservation-worthy wildlife or livestock?			
	10. Lead to a significant increase in congestion and related smog and noise.			
	11. Present a pollution risk to potable water supplies, or to surface water bodies that support conservation-worthy or commercially significant fish, due to accidents during the transport of hazardous materials?			
	12. Lead to unplanned settlement or access to conservation-worthy ecosystems or natural resources (e.g. agricultural land, timber, mineral, squatter settlements)?			
Mitigation Measures	13. Be likely to require mitigation measures that result in the project being socially or financially unacceptable?			
<b>Comments:</b> Will the project have significant environmental impacts?				
	Recommendation for full environmental assessment			

**Environmental Impacts:** The nature magnitude and significance of the impacts likely to be caused by the project to the receiving environment.

**Mitigation Measures:** Measures that may be taken to reduce, manage or compensate for environmental impacts.

The checklist should be used to review the project information available to make a preliminary assessment following this logical structure. Thus, use of the checklists will indicate the significance of likely environmental impacts and therefore the level of further environmental analysis/assessment required to mitigate and impact of considered serious. The project will be directed towards one of the two options:

### 2.3 Environment Assessment

The overall process of environmental assessment aims to integrate environmental considerations into the planning and implementation of road improvement projects. In practical terms, Environmental Analysis or an EIA study predicts the likely environmental impacts of a project,

determines measures to mitigating unacceptable impacts, and presents the predictions and most appropriate mitigation options to decision makers. It should also involve public consultation with interested parties and the affected population.

Environmental assessment/analysis involves six basic tasks

- Identification of project activities and alternatives
- Scoping
- Prediction of Impacts
- Evaluation of Impacts
- Identification of mitigation measures
- Presentation of results

### 2.3.1 Identification of alternatives

Identifying project activities and alternatives and comparing their environmental impacts is a key aspect of undertaking and Environmental Assessment. What alternatives are to be considered depends upon which stage of the project cycle the project has reached and should be made explicit during the scoping phase. For example, field assessments may be concerned with alternatives for site selection, transport routing etc. Further into the project cycle, for example at the improvement plan preparation, there is more emphasis on identifying project component alternatives in the light of specific design requirements such as routing through human settlements, wildlife habitats, etc.

An Environmental Analysis or EIA study should therefore report on the environmental implications of choosing between these alternatives, including those choices made prior to the study. Throughout this iterative process each alternative should, at a minimum, be contrasted with the 'do nothing' scenario and the environmental consequences of the baseline situation.

### 2.3.2 Scoping

Scoping involves the identification and narrowing down of potential environmental impacts so that the E.A

focuses only on those that are likely to be significant. There are a number of methods that can be applied to identify impacts. One such method is the use of checklists or questionnaires to identify all the project's potential 'sources' of

environmental impacts, e.g. erosion, dust displacement of people., water pollutants, destruction of natural sites. etc, and then list possible 'receptors' in the environment, e.g. crops, communities or water bodies. This is done by surveying the existing environment and consulting, with interested parties.

### **2.3.3 Prediction of Impacts**

Once identified, the potential magnitude (size and nature) of the environmental impacts must be predicted. To prevent unnecessary expenses, the sophistication of the predictive methods used should be kept in proportion to the span of the importance of the particular impact. Examples of potential impacts are Provided in Section 5 of this Manual.

### **2.3.4 Evaluation of Impacts**

Early in the project cycle, alternative project sites, routes or project types should be evaluated to identify and compare how each is likely to affect the environment. . It is important to appreciate that decisions stemming from the examination of alternatives prior to the environmental assessment are likely to be influenced just as much, if not more, by economic, social or political concerns as they are by environmental factors.

Although environmental implications of alternatives may have been given full consideration from the earliest stages, the final project may still have pose adverse environmental effects. The significance and acceptability, of these impacts may be determined by evaluating the predicted effects against criteria for environmental quality standards, public preferences, expert opinion etc. Where an impact is evaluated as being unacceptable against these criteria, ways should be sought to mitigate the impact through changes in design or methods of construction or operation.

### **2.3.5 Identification of Mitigation Measures**

Where the results of an Assessment show that certain impacts are likely to be environmentally damaging, mitigation measures need to be identified so as to

reduce these impacts to within acceptable levels. These measures are outlined in Section 5 of this Manual.

### 2.3.6 Presentation of Results

The final task in an **E.A.** is the presentation of so that decision makers can be informed of what needs to be done. to ensure environmental due diligence.

Many technically first-rate studies fail to be useful because of poor documentation. E.A The can achieve its purpose only if its findings are clear and concise and effectively presented to decision-makers. In some organizations, a special term is given to the final product of an EA : An 'Environmental Impact Statement'.

## 2.4 Monitoring

Once a project is being implemented, the environmental consequences, positive or negative. need to be addressed as part of the usual monitoring process. The focus of environmental monitoring is three-fold:

- Evaluation of the predicted environmental impact of projects, and of the effectiveness of the environmental mitigation measures as originally agreed.
- Advance warning of adverse changes in the baseline environment resulting from implementing a project. and assessment and evaluation of any unforeseen environmental impacts.

The monitoring report determination of remedial measures should , demonstrate the success or failure of the environmental protection measures, and identify and evaluate and mitigate an unforeseen environmental impacts.

The Safeguard Unit of LAMATA will monitor the project and report its EMP AND AUDITING procedures to the regulatory agencies as at when due.

## 2.5 Project Evaluation

Incorporating environmental factors into the evaluation process establishes whether a project has achieved its overall environmental objectives. Evaluation should present the principal environmental lesson that have been learned.

Secondly, it should determine whether the procedure and methodology associated with the system of environmental appraisal were being implemented effectively. If environmental issues are particularly serious in the project, it may be appropriate to commission an Environmental Audit as a specific study the evaluation.

, The relevant Safeguard Unit for the road authority in collaboration with the Federal Ministry of Environment and the Lagos State Environmental Protection Agency (LASEPA), will take evaluation responsibility.

### **2.5.1 Institutional Responsibility for Environmental Assessment Activities**

Responsibility for the E A is at two levels:

- (i) taking responsibility to ensure a particular activity is undertaken and making available the resources for doing so; and
- (ii) implementing or executing the particular activity. In some cases, an activity may be undertaken by the same actor.

Decisions to undertake and mobilize the resources for various aspects of the environmental assessment (review and assessment) is the responsibility of the Safeguard Unit of LAMATA. LAMATA will ensure appropriate staff are in place and trained to constitute the staff of the Safeguard Unit which will undertake required EA decisions on its behalf.

Implementation/execution of the various EA activities will be undertaken by various actions including the Safeguard Unit of LAMATA, Contractors and Environmental Management Consultants and Engineers from the private sector or specialized government departments.

## **SECTION 3**

### **REQUIREMENTS FOR PUBLIC CONSUMPTION**

Nigerian Environmental Impacts Assessment (EIA) Policy 1992, requires that public consultation be an integral part of carrying out EA studies.

#### **3.1 Minimum requirement:**

At minimum, the proponent must meet with the principal stakeholders to inform them about the proposed road works, construction, rehabilitation maintenance and to solicit their views about it.

#### **3.2 Purpose of Consultation**

During the different phases or implementing road rehabilitation and maintenance works, individuals, communities, business sector and the general public will be affected differently. For example, implementation of road works may provide employment opportunities, may displace them from their homes, may introduce new social and cultural values, or create noise and pollution which will affect their health. or the natural environment If they are consulted about the project,.

- Their anxieties and concerns may be reduced and the proposals may readily be accepted.
- They are better able to appreciate the opportunities the project may bring
- They can point out issues of concern to them and what they value most in the environment;
- They may provide useful suggestions which may improve the design and implementation of the works and
- They may cooperate with easily with the contractors.

#### **3.3 Stages of Consultation**

Consultation with the relevant stakeholders shall be conducted throughout the project cycle. However to be more effective consultation should be timed to coincide with significant planning and decision making activities in the project cycle.

#### **3.4 Forms of Consultation**

Various methods of public consultation may be used. For the purpose of road works, several are listed and include:

- Individual/personal interviews
- Community meetings
- Advisory committees
- Public hearings
- Information notices brochures
- Press conference
- Questionnaires

No one method is usually sufficient by itself to achieve an effective public consultation. Therefore, it is recommended that the Safeguard Unit should incorporate at least 2-3 or more methods which complement each other in ensuring adequate public consultation.

## **SECTION 4**

### **SOURCES OF ENVIRONMENTAL IMPACTS FROM ROAD DEVELOPMENT AND IMPROVEMENT PROJECTS**

Environmental impacts depend upon the type of the project. Environmental impacts from road development and improvement project may arise from:

- Construction of new roads;
- Rehabilitation of existing roads;
- Upgrading and spot improvement;
- Routine and periodic maintenance of existing roads

Environmental Impacts may arise from Road Development and Improvement Projects through

- Project inputs;
- Project activities; and
- Project outputs.

#### **4.1 Road Improvement Project Inputs**

Project inputs (with potential to give rise to significant environmental impacts) refer to those materials and supplies that are required for the execution of road improvement project. These may include the following:

- Construction materials
- Heavy machinery and vehicles
- Petroleum Products and other chemicals
- Labour
- Energy and other social services

#### **4.2 Road Development and Improvement Activities**

Project Activities (with potential to give rise to significant environmental impacts) refer to those materials and supplies required for the execution of road improvement projects (rehabilitation and maintenance). These may include the following:

- Surveying
- Material mobilization and handling

- Heavy machinery and vehicle movement
- Site installation
- Stock pile area preparation
- Quarrying
- Construction of detours, access roads and plant park sites
- Preparation and formation of the carriageway
- Drainage excavations
- Asphalt plant operations
- Acquisition of energy and other social services
- Social interaction
- Relocation

### 4.3 Road Improvement Outcomes/Outputs

Road development and improvement outcomes/outputs: refer to materials, activities and processes resulting from road construction, rehabilitation and maintenance activities with potential to give rise to significant environmental impacts. These may include the following:

- Excess construction material
- Domestic refuse and sewage wastes
- Petroleum and chemical spillages and leakages
- De-vegetated areas
- Post excavation and grading works
- Drainage systems
- Abandoned structures
- Improved roads
- New settlements

Project preparation, implementation and supervision activities that require stakeholder.	Responsibilities for consultation	Stakeholders to be consulted.
<b>Preparatory works</b> 1.selection of roads 2.field assessment. 3.improvement plan, 4.preparation of tender documents.	Road highway authorities consulting engineers.	<b>GOVERT</b> .line departments general public beneficiary communities tender Board,
<b>Tendering process</b> 1.invitation to tender, 2.pre-tender site visits 3.receipts and opening	Road high ways authority consulting Engineers.	<b>General beneficiary public communities.</b>

<b>of tenders</b>		

## **SECTION 5**

### **POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

#### Potential Receptors of Environmental Impacts

Environments needing special attention because of their ecological or socio-economic sensitivity to road improvement activities have been identified and include both natural and human environments.

Natural environment receptors of potential impacts from road improvement activities include the following, among others:

- Areas supporting significant bio-diversity such as wetlands ecosystems
- Quality of surface water bodies (e.g rivers, lakes, wells)
- Wildlife and forested areas
- Sites of significant cultural, religious or historical importance
- Protected areas (on local, national and international scales) e.g national parks, forestry reserves and game management areas and water falls.
- Sites supporting aquatic flora and fauna, including:- rare species

Human Environment receptors of potential impacts from road improvement activities include:

- Rural settlements or urban housing served by specific roads to be improved
- Land uses (e.g agriculture land, recreational areas) in proximity to the roads
- Cultural sensitivity to induced development along route
- Public health consequences (during construction and use)
- Capacity of local public services to support the increased demands of passenger and freight traffic or induced development.
- Environments already significantly degraded such as grazing areas and agricultural lands.

### **5.1 Potential Environmental Impacts and Mitigation Measures**

Road improvement projects will lead to a number of potentially significant environmental impacts. Some of these are outlined in Table 5.1 – 5.22. Impacts of inputs are in many cases similar to those of activities and outputs. Therefore, the manual focuses on activities and outputs of road improvement activities. These impacts may be mitigated by various measures outlined in the tables.

### **5.2 Reference Materials**

This procedural manual is based on key environmental assessment documents including the following:

- (x) Environmental Impact Assessment Procedural Guidelines for the Federal Republic of Nigeria, 1995
- (xi) Environmental Impact Assessment Decree 1992
- (xii) National Guidelines on Environmental Management System in Nigeria, 1999
- (xiii) National Environmental Protection Management of Solid and Hazardous Wastes Regulations 1991.
- (xiv) National Guidelines on Waste Disposal Through Underground Injection, 1999
- (xv) Lagos State Government Policy on the Environment, 1997
- (xvi) Lagos State Environmental Protection Agency: State of Environment Report, 1997
- (xvii) Guidelines and Standard for Environmental Pollution Control in Nigeria.
- (xviii) Guidelines for management of solid hazardous waste.