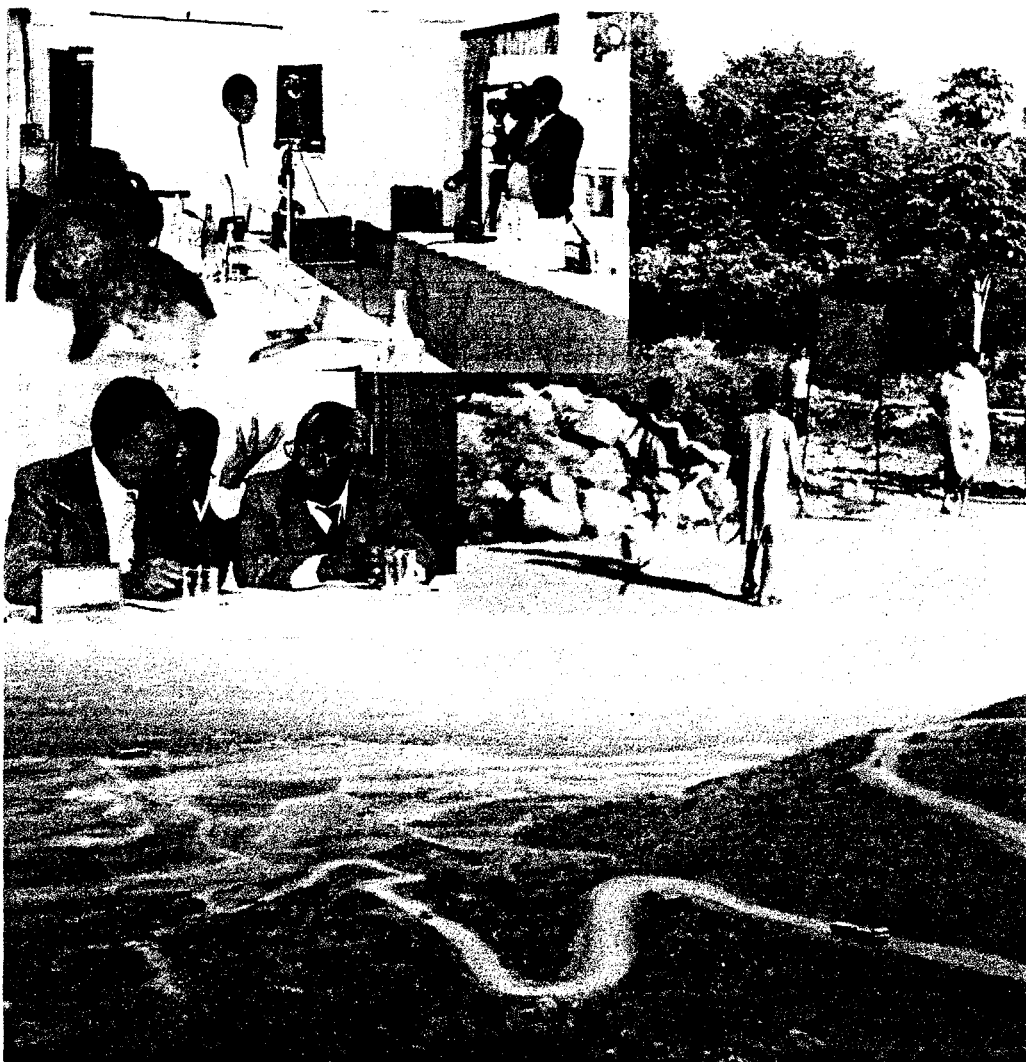


The Federal Democratic Republic of Ethiopia  
Ethiopian Roads Authority  
International Development Association

E-221  
VOL. 6

## ENVIRONMENTAL IMPACT ANALYSIS OF THE ROAD SECTOR



**Final Report**

**October 1997**



**PLANCENTER LTD**

Opastinsilta 6, FIN-00520 HELSINKI, FINLAND  
Phone +358 9 15641, Fax +358 9 145150

## TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS .....	iv
MAP SHOWING THE MAIN POPULATION CENTERS AND ROADS .....	v
0 EXECUTIVE SUMMARY .....	ExSum-1
1 INTRODUCTION .....	1
1.1 Background .....	1
1.2 Objective of the Study .....	1
1.3 Study Approach and Methodology .....	2
1.4 Contents of the Report .....	2
2 INSTITUTIONAL FRAMEWORK .....	3
2.1 Policy Framework .....	3
Development Policy Framework .....	3
The Constitution .....	3
Environmental Policy of the FDRE .....	4
Sectoral Policies and Strategies .....	5
Cross-Sectoral Policies .....	6
2.2 Legal Framework .....	6
Draft Sector Guidelines .....	7
Procedural Guidelines for EIA .....	7
Environmental Impact Assessment Regulations .....	8
Framework Environmental Legislation .....	9
Assessment of the Legal Framework .....	9
2.3 Road Sector Organizational Framework .....	10
Responsibility for Road Network Development .....	10
Optimizing the Environmental Impact of Road Development .....	10
The Road Sector in Cross-Sectoral Coordination .....	11
Environmental Management Branch in ERA .....	12
ERA Environmental Management Branch Staffing and Staff Development .....	13
2.4 Training .....	14
Training Needs of the Environmental Management Branch Personnel .....	14
Training Needs of other ERA Personnel .....	15
2.5 Cost Estimate for the Environmental Management Branch of ERA .....	16

3.	OVERVIEW OF PROPOSED SECTOR PROGRAM .....	17
3.1	Background and Justification .....	17
3.2	Strategy and Policy Reform .....	17
3.3	Environmental Implications .....	18
4.	CRITICAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES ...	20
4.1	General .....	20
4.2	Physical Environment: Erosion Hazards .....	20
	Environmental Conditions .....	20
	Erosion Hazards .....	21
	Mitigation of Erosion Risks .....	22
	Monitoring .....	23
4.3	Physical Environment: Pollution Hazards .....	23
	Water Resources and Water Quality .....	23
	Air Pollution .....	24
4.4	Natural Environment .....	24
	Flora .....	24
	Fauna .....	25
	Adverse Impacts .....	25
	Mitigating Measures .....	26
4.5	Human and Social Environment .....	26
	Impact Identification and Assessment .....	26
	Public Consultations .....	28
	Mitigation Measures in General .....	29
	Compensation .....	30
	Resettlement .....	32
	Induced Development .....	34
	Environmental Health .....	37
	Cultural, Historical and Archeological Sites .....	39
5	ENVIRONMENTAL MONITORING .....	40
5.1	Responsibilities for Monitoring .....	40
5.2	Monitoring in Individual Road Projects .....	40

## APPENDICES

- Appendix 1. List of Team Members
- Appendix 2. References/Baseline Documents
- Appendix 3. List of Organizations, Institutions and Persons Met/Interviewed
- Appendix 4. Minutes of Meetings with ERA
- Appendix 5. Program and Presentations of the Workshop held on 22.7.1997
- Appendix 6. Field Visit Program
- Appendix 7. Scoping Table
- Appendix 8. Questionnaires for ERA, EPA and NGOs
- Appendix 9. Organization Chart of ERA
- Appendix 10. Baseline Data/Physical and Natural Environment
- Appendix 11. Comments of the World Bank to the Inception Report (21.7.1997)
- Appendix 12. Comments of the World Bank to the Draft Final Reports  
(e-mail 19.8. and 21.8.1997)
- Appendix 13. Minutes of the Final Workshop 15.9.1997
- Appendix 14. Comments of ERA to the Draft Final Reports (October 1997)
- Appendix 15. Letter to ERA 9.10.1997 (re: Sending Final Summary Report; commenting  
the comments; and cost estimate for compensation of houses)
- Appendix 16. Terms of Reference (ERA, September 1996)

## ABBREVIATIONS AND ACRONYMS

ADLI	Agricultural-Development-Led-Industrialization
EA	Environmental Assessment
EELPA	Ethiopian Electric and Power Authority
EFAP	Ethiopian Forestry Action Plan
EIA	Environmental Impact Assessment
EIRR	Economical Internal Rate of Return
EPA	Environmental Protection Authority
EPE	Environmental Protection of Ethiopia (Proclamation 1/1995)
ERA	Ethiopian Roads Authority
ETCA	Transport Construction Authority
EU	European Union
FA	Farmers Association
FDRE	Federal Democratic Republic of Ethiopia
INGO	International Non-Governmental Organization
ITCZ	Inter-Tropical Convergence Zone
KAT	Kembata Alabana Timbaro (Zone)
m.a.s.l.	meters above sea level
MEDAC	Ministry of Economic Development and Cooperation
NEPA	National Forest Priority Areas
NGO	Non-governmental Organization
NPV	Net Present Value
PA	Peasants Association
RGRRO	Regional Government Rural Road Organization
RSDP	Road Sector Development Program
SNNP	Southern Nations and Nationalities and Peoples (Region)
STD	Sexually Transmitted Diseases
TCDE	Transport Construction Design Enterprise
TOR	Terms of Reference
TFR	Total Fertility Rate
TGE	Transitional Government of Ethiopia
VD	Veneral Diseases

PROPOSED ROAD UNDER RSDP  
TRUNK ROAD

- |                             |                        |
|-----------------------------|------------------------|
| Phase 1                     | Phase 2                |
| Asphalt Upgrading Road      | Asphalt upgrading Road |
| Gravel upgrading Road       | Gravel upgrading ROAD  |
| Asphalt Rehabilitation Road |                        |

MAJOR LINK ROAD

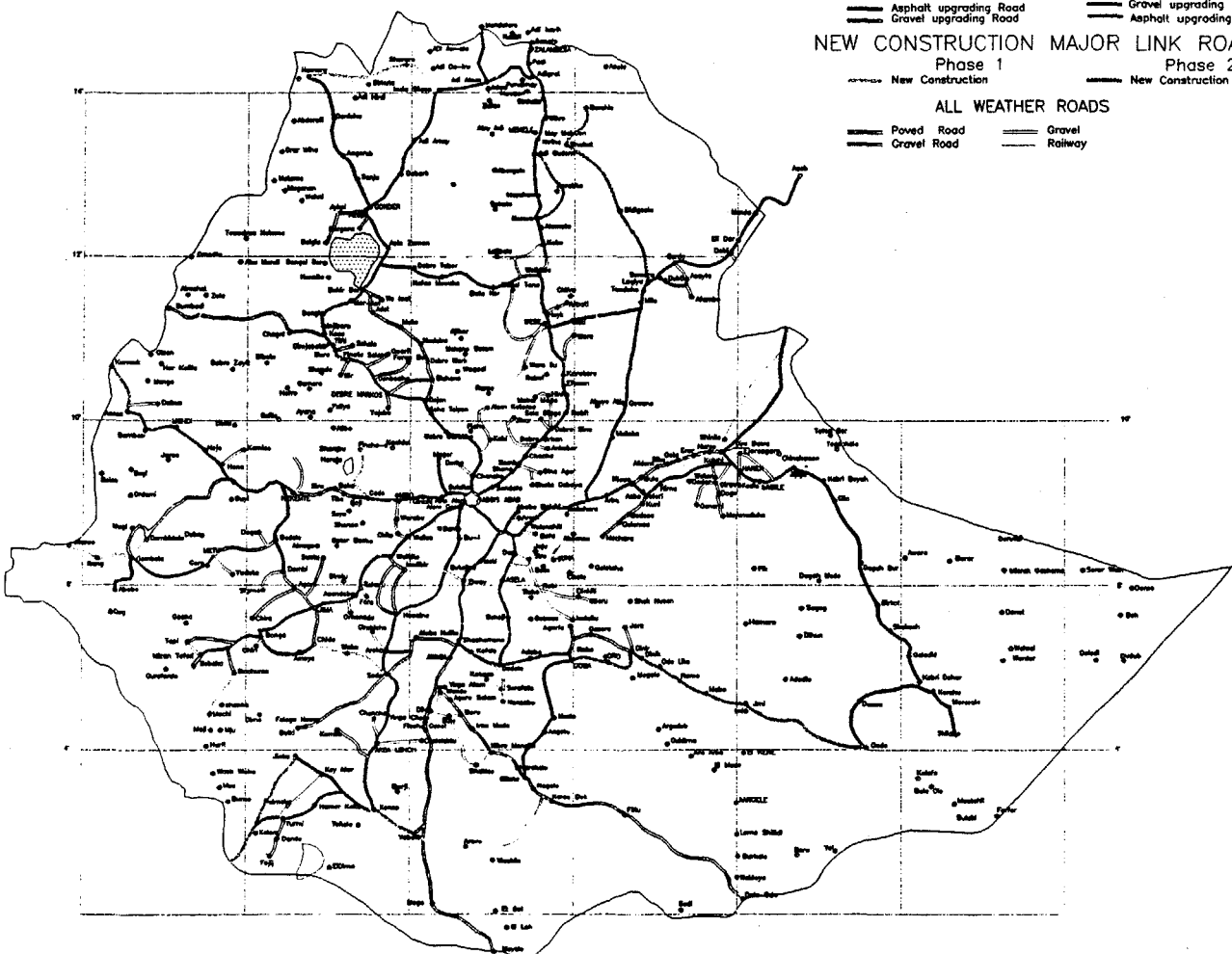
- |                        |                        |
|------------------------|------------------------|
| Phase 1                | Phase 2                |
| Asphalt upgrading Road | Gravel upgrading Road  |
| Gravel upgrading Road  | Asphalt upgrading ROAD |

NEW CONSTRUCTION MAJOR LINK ROAD

- |                  |                  |
|------------------|------------------|
| Phase 1          | Phase 2          |
| New Construction | New Construction |

ALL WEATHER ROADS

- |             |         |
|-------------|---------|
| Paved Road  | Gravel  |
| Gravel Road | Railway |



FEDERAL GOVERNMENT OF ETHIOPIA ETHIOPIAN ROAD AUTHORITY	
THE ENVIRONMENTAL IMPACT ASSESSMENT OF THE ROAD SECTOR	
PLANCONET Ltd. P/NE/AND	
ROAD MAP OF RSDP	
Figure	Date

## 0 EXECUTIVE SUMMARY

The Environmental Analysis of the Road Sector of Ethiopia has been prepared for the Ethiopian Roads Authority (ERA) by Plancenter Ltd of Finland. The whole work consisted of two types of studies: (i) a Road Sector Environmental Assessment focusing on the sector planning process with the policy, regulatory and institutional framework, and on environmental principles, standards and guidelines for road projects (this report) and (ii) a Site Specific Environmental Assessments for five planned road components: Alemgena - Hossaina - Sodo Road, Woldiya - Adigrat - Zalambessa Road, Debre Markos - Gondar Road, Awash - Kulubi - Dire Dawa - Harar Road and Mojo - Awash - Mille Road. Separate reports as well as a summary report were prepared of the site specific EAs.

The purpose of the Environmental Assessment of the Road Sector has been to identify the most critical environmental issues for the road sector in Ethiopia; assist the government of Ethiopia in developing in-country capacity for road sector EIA by developing the policy/ regulatory and institutional framework for EIA, as well as strengthening the EIA capacity in all institutions involved, i.e. in governmental road sector and environmental agencies and among national contractors; define environmental principles for road development and specific environmental criteria to be incorporated into the process of selecting priority roads for RSDP; and initiate the development of environmental guidelines for road projects in Ethiopia, covering environmental considerations in all stages of a road project from identification and selection of roads and alignments, through design and implementation to the monitoring and evaluation of results.

### *Institutional Review*

The institutional framework for road sector development in the Federal Democratic Republic of Ethiopia (FDRE) was reviewed, including policy, legislation, regulatory aspects, and sector organization. The review focused on those aspects which ensure that the environmental impact of development is optimized, and adverse impacts mitigated.

*Policy.* Economic policy focuses on promoting economic growth through a market-based economy with considerable private sector participation. The main declared vehicle is Agricultural-Development-Led-Industrialization (ADLI), for improving productivity in small-holder agriculture, and related industrial development based on the increased supply of domestic raw materials.

The major environmental policy framework is contained in the "Environmental Policy of the FDRE" approved by the Council of Ministers in April, 1997. The policy was prepared by the Environmental Protection Authority (EPA) in collaboration with the Ministry of Economic Development and Cooperation (MEDAC). The policy includes the goals, guiding principles, and the institutional, legislative, monitoring and evaluation mechanisms for its implementation. It also outlines sectoral and cross-sectoral policy, and requires Environmental Impact Assessment (EIA) of public and private programs and projects, considering physical, biological, social, socio-economic, political and cultural impacts. It considers public consultation an integral part of EIA, and requires monitoring of issues identified in the EIS, and mitigation plans for adverse impacts and contingency plans for possible accidents.

The sectoral policy status can be summarized as follows:

- a national land use policy is currently being drafted by the Ministry of Agriculture;
- the Ethiopian Forestry Action Program, prepared in December 1994, provides the basis for developing forestry policy at the Federal, Regional and local levels;
- a forest management policy is under review by the Government;
- the Ministry of Agriculture has formulated a draft wildlife policy and strategy together with the related law and regulations governing wildlife conservation, development and utilization at the national level. It provides i.a. that (i) all development activities within

- parks will be subject to an Environmental Impact Assessment and, (ii) in case of proposed developments outside protected areas, which could affect those areas, an Environmental Impact Assessment should be carried out and the results made public;
- Water Resources Policy, being developed by the Ministry of Water Resources; and
  - Biodiversity Policy, under drafting by the Ministry of Agriculture.

Cross-sectoral policies that are of interest to the road sector EA are the National Population Policy and the National Policy on Ethiopian Women, both issued in 1993. The latter provides i.a. that development institutions, programs and projects shall ensure women's access to and involvement in all interventions and activities.

*The Constitution.* The Constitution, from 1995, provides for decentralizing by allocating considerable legislative, executive and judicial power and responsibility to nine regional States. The Federal Government retains such power for nationwide concerns. The ownership of land and natural resources is vested in the State, but rural households with rights to use the land are given guarantees against eviction. The Federal Government enacts laws on land utilization and conservation. The development, administration and regulation of major roads linking two or more states is also the responsibility of the Federal Government; regional (rural) roads are under the jurisdiction of regional states. The House of Peoples Representatives has the power, *inter alia* to enact specific laws relating to major roads linking two or more states.

The Constitution provides that "*All persons have the right to a clean and healthy environment*"; and that the local population will be compensated -- including resettlement -- for displacement or adverse effects on their livelihood, resulting from its programs. Nationals, including women, have the right to be consulted with respect to policies and projects affecting their community.

*Subsidiary laws and regulations.* The Environmental Protection Authority (EPA) was established by Proclamation 9/1995 to act as an independent regulatory body for all other development sectors, and to ensure that their activities are environmentally sound and sustainable and in line with the environmental policies, laws, regulations and guidelines. EPA prepares environmental protection policy; laws; standards for the protection of soil, water and air and biological systems; directives and systems for evaluating the impact of development projects on the environment; and monitor and supervise the implementation and impacts. EPA has prepared draft guidelines on (i) Environmental Impact Considerations for Transport Sector Projects; (ii) Procedural Guidelines for EIA -- including its integration into the project cycle; (iii) Environmental Impact Assessment Regulations; and (iv) Framework Environmental Legislation, which are currently under review both in-house and by other stakeholders. A workshop has been scheduled in September 1997 for relevant sectoral agencies and stakeholders to discuss the draft framework legislation.

The consultant proposes adding, to the regulations, a time limit for decisions on project acceptability and the type of possible EA needed, or for the decision during review, of the acceptability of an environmental impact study which has been prepared.

In other sectors, it is significant that the Forestry Conservation, Development and Utilization Proclamation No. 94/1994 provides i.a. that state and regional forests can only be designated after consultations with and consent by farmers and subject to ensuring their benefits when eviction is likely.

*Organizational structure.* The supreme organ of the Federal state is the House of Peoples Representatives, which enacts federal laws. Proclamations, policies, and major national development programs, are passed by the Council of Ministers. Regional Governments can pass regional legislation. In the road sector, the Ethiopian Roads Authority (ERA) is in charge of preparing and implementing federal level programs; in Regional Governments, these functions are taken care of by the Rural Road Organizations (RGRROs), with support from the ERA Rural



Roads Department. Environmental units have been set up by the road administrations at all levels.

Despite the setting up of EPA as an efficient environmental regulator, the guidelines it prepares require the approval of the Environmental Council, which does not function yet. Thus the legal status of the guidelines will be weak up to the approval.

At the regional level, there are Regional Environmental Coordinating Committees already functioning, chaired by the Vice President of the regional state and with representatives of relevant bureaus. These can serve as coordinating committees, and liaise with EPA at the federal level. Corresponding committees have also been established at local levels.

An environmental unit has been established in ERA, but it has not yet been staffed. Staffing could at least initially be composed of only five specialists (see table on the following page), and still cover the key needs for both environmental assessment and the training of road sector staff in environmental impact optimization. The unit, which will probably be established as the Environmental Management Branch, would extensively use specialist staff from other ERA entities, as well as private consultants, for impact assessment tasks.

It is imperative that the unit is developed into a closely knit team, the members of which can to some extent replace each other in urgent assignments. This will require special qualities from the team members. Especially the task of the EA Manager will be very demanding; she/he will need to have good social/organizational skills and good training for the post.

#### *Training Needs*

Depending on their background there may be a need for further environmental training for the staff of the Environmental Management Branch. The training requirements shall be further assessed, once the personnel has been appointed. The Consultant assumes that 1,5-3 months training abroad could be suitable as additional training. There are specific training programs in EIA, strategic EIA, social impacts assessment etc. To guarantee the early functioning of the Environmental Management Branch, it should be seen that all the Branch personnel is not going for training at the same time.

All the personnel of ERA on the planning and decision making level as well as the implementation, operation and maintenance level should be given some kind of environmental awareness training, which can be organized as workshops or short training courses. The in-house training could be given by the personnel of the Environmental Protection Branch of ERA. Additional trainers can be hired from for example EPA.

It is recommended that each ERA District Office would appoint and train a person in charge of environmental issues. These persons could be either trained in special training courses (e.g. abroad) or as in-house training.

Position	Main Tasks and Responsibilities	Qualifications
EA Manager	Branch leadership & management Policy & strategy advice Technical inter-institutional cooperation Technical (economic, social, physical, ecological) acceptability & prioritization of projects & measures EA training management	MSc or equivalent degree in disciplines with environmental management background Management and team building experience Extensive environmental training (incl. EA)
Environmental Engineering Specialist	Environmental impact assessment of engineering solutions Evaluation of road plans, alignments, designs and maintenance Trainer in environmental engineering Environmental Modeling	Engineering degree Experience in road design & engineering & modeling Training/experience in environmental impact analysis and mitigation
Hydro-geologist	Specialist/adviser in erosion control, road stabilization, hydrological impacts of road development, as well as accidents and chemical risks and bioengineering Trainer in hydrological, geological, and soils issues & problem solving	M.Sc. in Hydrogeology, Engineering Geology Teamwork and teaching skills Training/experience in environmental impact analysis and mitigation
Ecologist	Specialist/adviser in mitigating adverse biological and ecological impacts of roads Trainer in ecological environmental optimization & problem solving	M.Sc. in Biological Sciences Teamwork and teaching skills Experience and training in EA & infrastructure projects desirable Demonstrated understanding of ecological modeling desirable
Sociologist or Socio-Economist	Specialist/adviser in community development, public participation, and social/socioeconomic baseline and impact studies, land use issues Trainer in the optimization of social impacts	M.Sc. in Sociology or equivalent Good understanding of economics and infrastructure projects an asset Experience in social impact analysis/synthesis desirable

Table. Proposed manning and tasks of the Environmental Management Branch of ERA.

## Environmental Overview of RSDP

The scattered pattern of settlement and economic activities in Ethiopia makes well functioning transportation system a prerequisite for economic development. Furthermore, in such circumstances a road network has been and will be the backbone of the transportation system. Growth in agricultural output, which is visioned as the primary basis for the development in the country, is dependent on an efficient road transportation system integrating the rural communities with urban centres, and further to facilitate cost efficient transport of export crops to the ports.

The RSDP provides a comprehensive approach to integrating the implementation of key road investment with major policy and institution reforms. The program covers the period 1997 to 2007, divided into two five-year phases. It outlines plans to improve the condition of the existing network by extensive rehabilitation and upgrading, and substantial expansion of rural roads network. In addition to physical targets the RSDP focuses e.g. on institutional development, priority setting of investments, labor based technology, road safety, control of vehicle axel loads and environmental issues. As such the RSDP is one of the basic instruments of the Government in the implementation of ADLI approach in the national and regional development. However, the RSDP is an ambitious program for a relatively short time period, and the success from environmental sustainability point of view will mainly depend on the progress in institutional development. In this regard capacitation of the Environmental Management Branch of ERA is the key issue.

The RSDP is formulated in such a way that it will deal with the issues of competing investment demands between restoring the existing network and extending the network into areas currently not served by roads. To allocate investments in an optimal way between the two is a fundamental consideration of the program, since the current road network is limited both in terms of coverage and quality. The necessity to extend the road network to support the development efforts of the country is beyond doubt. At the same time preventing the existing network from further deterioration is the most crucial matter. Accordingly, the RSDP gives high priority to maintenance and rehabilitation works as well as to upgrading the standard of trunk roads and major link roads. The existing network would be expanded by constructing new regional roads and major link roads if network stability and economic development assessment justify it at regional or national level.

A general priority setting mechanism at RSDP level on environmental grounds is not seen possible by the Consultant. It is possible to compare two or more specified projects (roads) based on environmental impacts, but this requires setting of weightages for different issues, and setting of numerical measuring principles for various impacts, which are difficult in a manner acceptable to all interest groups. Importance (weightage) of various issues also varies from case to case. Similarly it is impossible to define 'environmental costs' or 'benefits' comparable with financial inputs. Because of these difficulties the environmental assessment should not be expected to solve prioritization problem. However, it helps to identify and cancel environmentally hazardous projects as well as the environmentally sound projects for further planning, design and implementation.

The strong emphasis on rehabilitation and maintenance of existing road network is in general a positive environmental implication of the RSDP. Adverse impacts of road rehabilitation on the natural environment are less compared with a new road. Similarly, potential erosion hazards are far more critical when planning and constructing new roads.

## **Critical Environmental Impacts**

### *Physical Environment*

One of the most important issue of environmental impacts in a road project is soil erosion. Erosion is a function of the stage of construction (rehabilitation/ upgrading and new construction) and the physical environmental condition (geology, climate, soil, topography and surface and groundwater hydrology). Erosion with road construction is often associated with unstable geological conditions in a form of landslides, which can be a natural phenomena or caused by human activities (e.g. blasting of road cuts in critical slopes). Sheet and rill erosion and formation of gullies happen both naturally but is also highly accelerated by road construction if fresh soil slopes are not properly and timely protected and if drainage arrangements are not efficient. River bank scouring during peak runoffs and floods is also a serious erosion risk which may threaten roads along rivers or bridges and other structures crossing rivers.

Problems associated with critical geological conditions and river bank erosion should be tackled by avoiding the sensitive slopes and river sections, as far as possible. Accordingly, careful siting of road alignments and major structures is the main means to avoid hazards. Structural measures to control unstable slopes or protect river banks are relatively expensive and should be the solution (only) in the cases where alternative siting is not possible.

Sheet and rill erosion of exposed road slopes (cut and fill slopes) are largely controlled by good engineering practise. Slope protection by bio-engineering techniques should be emphasized as far as possible. Bio-engineering, as well as other slope protection measures are very site specific and can be selected preliminarily in engineering design stage, and finally during the construction.

### *Natural Environment*

One of the major unavoidable impact of roads is the effect on the terrestrial vegetation in the vicinity by the virtue of the construction. The impact on natural vegetation would be associated with operating the quarry and borrow areas, and constructing diversion road and access to the quarry sites. Major environmental impact will also results from excessive widths of right of way, which might be required to accommodate oversized equipment. While some flexibility is essential to achieving stability of cuts and fills, exacting principles of design also need to be adhered in order to avoid excessive destruction of vegetation and disturbance of land.

Uncontrolled use of wood for energy and for construction purposes during a road project may lead to significant destruction of forest resources locally.

The construction of some roads will penetrate parts of National Parks or other sensitive areas, and will require land clearing, which will cause an impediment to movement of wildlife and destruction of wildlife habitat. As a proposed road project could be new, therefore, the wildlife which presently inhabit the proposed project area may be forced to migrate to other areas during construction and change in the existing species of mammals and birds can result within the park. This temporary displacement may be significant to cause catastrophe. The major potential adverse impacts include extinction of important or indigenous species.

New road alignments through National Parks, Sanctuaries, Wildlife Reserves and Controlled Hunting Areas should be avoided. If not possible, a detailed EIA is always necessary. Staff and experts of the concerned sensitive reserve shall be involved in inventories of EA, as well as in further planning of any activities within the area.

Use of local natural resources for energy, food or construction purposes should be controlled and

done only in a planned way. Hunting, fishing and collecting firewood by the project staff should normally be restricted. If such resources are available the right to harvest (and sell) those should be with the local communities.

#### *Human and Social Environment*

The major human and social impacts of road construction are those related to social acceptability, resettlement, change of way of life, impacts on indigenous peoples, induced development and conflicts between locals and immigrants.

There will be at least temporary losses of agricultural and grazing land (for detours, construction camps, storage sites, asphalt plants etc.). Although ERA has the right to occupy any sites needed for the road construction, it has also the responsibility to compensate all lost property.

Some houses may have to be removed along the roads. The houses to be demolished are compensated according to the costs of a new similar house. The land is not considered as a property, but the crop or trees growing on it are considered to be property when with commercial value and shall be compensated.

The road construction camps will have both short and long lasting impacts on the local communities. Although the construction camps/sites are planned to be temporary, the experience show that many camps turn out to be permanent settlement places after the construction period is over.

The improved roads make it easier to the tourists to reach the cultural and historical monuments and sites near the road. Even if the money they bring is valued, there should be plans already from the beginning to handle the tourist business with the controlled manner.

#### *Social and economic baseline data and potential impacts*

It is important to identify project-affected persons, properties and economic entities at the earliest stages of road planning, and to make more detailed assessments as the project is more fully defined. Impacts should be categorized in terms of the types of land, persons, and activities affected, and whether the effects are temporary or permanent. Where initial analyses identify possible effects on land use, land surveys and interview surveys are generally required to provide detailed information.

It is imperative to catalog and compensate all of the various forms of rights, whether legally recognized or not. If this is not done, people with only informal rights may not be compensated for assets and rights that are actually lost, which means that they might be impoverished. These concerns include for example right to seasonal pasture lands or common lands, and women's property rights and how there are followed in practice.

*Public participation and different consultations* with all the stakeholders about their values, attitudes and possible alternative solutions should be integrated into all phases of the project cycle.

*Appeal processes* must be clear and known to those affected by the project.

*Expropriation and valuation procedures* should be investigated, to determine:

- (i) whether properties are actually surveyed and assessed or simply estimated
- (ii) whether book or market values are used
- (iii) Whether negotiation and arbitration procedures are in place and work on a timely bases
- (iv) when and what manner payments are made to the affected parties

*Relocation assistance arrangements* should be reviewed, to determine:

- (i) what assistance will people be provided in the search for new locations
- (ii) what follow-up support will be provided
- (iii) what can be done for those, who for whatever reason, fail to re-establish their homes or businesses.

*Follow-up procedures* are required to monitor the effectiveness of compensation, relocation, and assistance programs, and to provide additional assistance to those who have not been sufficiently protected by the initial arrangements. Responsibilities, entitlement, and finance for these remedial processes need to be clearly defined in the action plan, taking account of the overlapping responsibilities of different government agencies.

*Institutional capability* to carry out the relocation and rehabilitation operation must be assessed. ERA's institutional capability, and especially its Environmental Management Branch must be strengthened to deal with all affected parties (e.g., small shops and enterprises), the legal right to acquire and transfer land title (in case of resettlement), and the administrative capacity to carry out the operation required especially in the social, economic and cultural aspects.

#### *Analysis of alternatives*

Valuations of road project impacts need to apply to all feasible options. They should recognize the full costs experienced by those faced with relocation of homes and businesses, and they should take account of renters, squatters, and employees as well as property owners. Consultation is essential in the comparison of options, since their impacts will depend on the priorities and perceptions of those affected.

#### *Mitigation and compensation plans*

Plans need to include the monitoring and measurement of approved indicators in all stages of the project and agreed points in time.

#### *Environmental specifications for contractors*

ERA has a responsibility to ensure that physical, natural, social, economic and cultural aspects are taken into consideration in the tenders.

These should ensure that temporary works and traffic management or the construction camps do not unduly impact physical or natural environment or nearby settlements, and land users and their social and economic concerns should be taken account.

The contractor is also responsible to see that the living conditions are sound and healthy in construction camps.

## 1 INTRODUCTION

### 1.1 Background

The Ethiopian Roads Authority (ERA) has prepared a Road Sector Development Program (RSDP). The program is planned for the years 1997-2007 and hence it will guide all road sector activities performed by ERA for the next decade. In the RSDP, ERA has reviewed the current status of the road network of Ethiopia, identified the key issues and set the strategic objectives for the Road Sector.

The RSDP is a comprehensive study and an ambitious program to develop the Ethiopian road management. In the program, all the necessary sections needed to achieve the goals concerning administration, planning, design, construction and maintenance of roads are included. Some attention is also paid to issues concerning road safety (inc. regulative aspects), labor, training, procurement of equipment, rehabilitation of facilities and even some reasoning of different travelling modes (villages). Of all the sections mentioned above, also some cost estimates are given.

For a large development program like the RSDP, an Environmental Assessment is considered necessary. The Ethiopian Roads Authority as the Client and the IDA as the funding organization, have contracted Plancenter Ltd from Finland to carry out the EA of the RSDP.

### 1.2 Objective of the Study

The whole work consists of two types of studies:

- A Road Sector Environmental Assessment focusing on the sector planning process with the policy, regulatory and institutional framework, and on environmental principles, standards and guidelines for road projects (this report)
- Site Specific Environmental Assessments for each of the five planned road components (reports were done before the sector report): Alemgena - Hossaina - Sodo Road, Woldiya - Adigrat - Zalambessa Road, Debre Markos - Gondar Road, Awash - Kulubi - Dire Dawa - Harar Road and Mojo - Awash - Mille Road.

The objective of an Environmental Assessment of the Road Sector as stipulated in the Terms of Reference prepared by ERA in September 1996 for this study is to *ensure that in-country capacity, regulatory framework, principles and procedures are established and will serve as the basis for environmental assessments of all future individual road construction being carried out under the RSDP*. More specifically, the purpose of the road sector analysis was to:

- Identify the most critical environmental issues for the road sector in Ethiopia;
- Assist the government of Ethiopia in developing in-country capacity for road sector EIA by developing the policy/regulatory and institutional framework for EIA, as well as strengthening the EIA capacity in all institutions involved, i.e. in governmental road sector and environmental agencies and among national contractors;
- Define environmental principles for road development and specific environmental criteria to be incorporated into the process of selecting priority roads for RSDP;
- Initiate the development of environmental guidelines for road projects in Ethiopia, covering environmental considerations in all stages of a road project from identification and selection of roads and alignments, through design and implementation to the monitoring and evaluation of results.

### 1.3 Study Approach and Methodology

The consultant has examined the following aspects of the road sector impact optimization in parallel:

- The social, economic, and physical environmental impacts of the five roads designated for individual study; these provide information for the Sector EA as well;
- the sectoral reporting and decision-making organization and process;
- road sector policy, including relevant environmental policy; and
- the legal and regulatory framework.

These systems have been reflected against experience from work in other countries and international organizations.

In the individual road EAs, in addition to identifying the potential impacts of the road construction to the physical and natural environment, special emphasis has been given to the potential human and social impacts. Through consultations with key agencies in the main impact zones of each route studied, and informal public consultations in these areas, the team recorded perceptions of road improvement plans as well as the impacts of the projects on their economic and social life. Mitigation and monitoring measures for the identified adverse impacts have also been identified.

In the Sector EA, besides assessing the environmental impacts of the RSDP, the work includes a brief analysis of staff capabilities and further training needs, as well as suggestions for organizational structures and their interaction, and guidelines for ERA in environmental management. Also mitigation and monitoring plans are developed for substantial issues and impacts.

The methodology used for carrying out the work included:

- collection and review of baseline data and relevant documentation, including relevant World Bank directives, guidelines and other documents; relevant legislation, policy papers and guidelines of the Ethiopian road and environmental sector, as well as other relevant sectors; designs for the proposed road improvements; maps; and background documentary sources (listed in Appendix 2)
- interviewing organizations, institutions and persons relevant to the work (listed in Appendix 3)
- site visits to the five proposed road sites (see site visit program; Appendix 4)
- during the site visit: consultations with governmental and non-governmental organizations relevant to the road section, interviews in various offices along the road, as well as informal road side interviews during the above site visit (the minutes of the public consultations are reproduced in the individual road EA reports)
- a workshop held in Addis Ababa on July 22, 1997 for organizations and institutions involved in environmental aspects of the road sector (the minutes of the Workshop are reproduced in Appendix 5)
- questionnaires for ERA, EPA and NGO's was also prepared, although most of the information was received during the organization visits and public consultations (Appendix 6)

### 1.4 Contents of the Report

This EA report consists of a description of the policy, legal and institutional setup of the environmental aspects of the Ethiopian road sector (Chapter 2), including the suggested staffing and training for the Environmental Management Branch of ERA. An overview of the ERA's Road Development Sector Plan from environmental point of view is presented in the Chapter 3. The critical environmental impacts and their mitigation measures are described in the Chapter 4 and monitoring plan is given in the Chapter 5.



## 2 INSTITUTIONAL FRAMEWORK

### 2.1 Policy Framework

#### Development Policy Framework

The overall economic policy focus of the Federal Democratic Republic of Ethiopia (FDRE) is on promoting economic growth through a market-based economy with considerable private sector participation, the Government providing the necessary services through a decentralized system.

The declared policy of Agricultural-Development-Led-Industrialization (ADLI) is directed to improving the productivity of small-holder agriculture and related industrialization, based on the increased supply of domestic raw materials to the industrial sector. These objectives are in conformity with the Road Sector Development Program (RSDP) of ERA (Chapter II, Second Draft Final Report, pp. 15-17). An adequate and well maintained road network is among the basic infrastructure components that lay the foundation for the projected economic development.

#### The Constitution

As a measure of achieving decentralization, the 1995 Constitution of the FDRE provides for two levels of organs of the state - the Federal Government and nine Regional States with their respective legislative, executive and judicial powers and responsibilities (Articles 40, 47, 50).

Ownership of land -- both rural and urban -- as well as other natural resources is vested in the State [Article 40(3)]. Therefore, land is not subject to sale or otherwise transferred and can only create use rights. The issue of security of tenure is also addressed to some extent in that the Constitution guarantees Ethiopian peasants against eviction from their possessory rights [Article 40(4)].

The enactment of laws for the utilization and conservation of land and other natural resources, historical sites, and objects, is also vested in the Federal Government, while the regional states are given the responsibility to administer land and other natural resources in accordance with Federal Laws [Articles 51(5)-2(d)].

The development, administration and regulation of major roads linking two or more states is also the responsibility of the Federal Government [Article 51(9)]. It is in line with this provision and the policy of decentralization that ERA is currently responsible mainly for trunk and major link roads, while regional (rural) roads are under the jurisdiction of regional states, namely, the Regional Government Rural Road Organizations (RGRRO). The supreme organ of the Federal state is the House of Peoples Representatives and has the power, *inter alia* to enact specific laws relating to major roads linking two or more states [Article 55(2) (c)].

Of direct relevance to the country's environmental policy, Article 44 of the Constitution provides that "*All persons have the right to a clean and healthy environment*". It also provides that state programs which result in displacement of people or adversely affect the livelihood of the local population shall give the right to commensurate monetary or other means of compensation including relocation (resettlement) with adequate state assistance [Article 44(2)].

With regard to participation and consultations of the local community, the Constitution provides that nationals have the right to participate in national development and in particular, to be consulted with respect to policies and projects affecting their community [Article 43(2)].

The rights of women to full consultations in the formulation of national development policies, and

in designing and executing projects, especially when such projects are likely to affect their interests, is also stipulated in the Constitution [Article 35 (6)].

In sum, the Constitution of the FDRE, as the supreme law of the country, provides the basic policy framework showing the Government's commitment to environmental protection and the sustainable management of the country's resources. It sets the framework upon which subsequent sectoral and cross sectoral policies, laws, and institutions are to be devised. All stakeholders are also assured participation and that they will be consulted in any government or private development programs or projects that are likely to have an impact on them.

### **Environmental Policy of the FDRE**

The major policy framework document with respect to environmental management of Ethiopia is the "Environmental Policy of the FDRE" approved by the Council of Ministers in April, 1997. The policy was prepared by the Environmental Protection Authority (EPA) in collaboration with the Ministry of Economic Development and Cooperation (MEDAC).

The environmental policy is quite comprehensive and provides the overall policy goals, objectives and guiding principles, sectoral environmental policies, cross-sectoral environmental policies and the institutional, legislative, monitoring and evaluation mechanisms for the implementation of the environmental policy.

Among the major policy issues contained in the policy document is the requirement of Environmental Impact Assessment (EIA) of programs and projects carried out both by the public and private sectors.

The section dealing with Government Policy regarding EIA provides:

- ensuring that EIAs consider not only physical and biological, but also social, socio-economic, political and cultural impacts;
- ensuring that public and private sector development programs and projects recognize any environmental impacts early and incorporate their containment into the development design process;
- recognition that public consultation is an integral part of EIA and ensure that EIA procedure make provision for both an independent review and public comment before consideration by decision makers,
- to ensure that an environmental impact statement always includes mitigation plans for potential environmental management problems, and contingency plans for possible accidents;
- ensuring that, at specified intervals during project implementation, environmental audits of monitoring, inspection and record keeping are done for activities where these have been required by the Environmental Impact Statement;
- ensuring that preliminary and full EIAs are undertaken by the relevant sectoral ministries or departments, if in the public sector, and by the developer if in the private sector;
- creating by law an EIA process which requires appropriate environmental impact statements and environmental audits for private and state development projects;
- establishing the necessary institutional framework and determine the linkages of its parts for undertaking, coordinating and approving EIAs and the subsequent system of environmental audits required to ensure compliance with conditionalities;
- developing detailed sectoral technical guidelines in EIAs and environmental audits;
- ensuring that social, socio-economic, political and cultural conditions are considered in EIA procedures and included in sectoral guidelines; and
- developing EIA and environmental audit capacity and capability in the Environmental Protection Authority, sectoral ministries and agencies as well as in regions;

The above detailed provisions with respect to Environmental Impact Assessment of programs and projects represent an adequate policy framework at the national level for conducting public and private sector EAs.

### **Sectoral Policies and Strategies**

There are many efforts in Ethiopia to develop detailed policies in the relevant Government sectoral Ministries and agencies involved in the sustainable development of the resources of the country. The following are some of the relevant policy areas that have been or are to be addressed in these sectoral policies:

#### **i) Land Tenure and Land Use Policy**

It has already been mentioned that under existing policy, all land and other natural resources are state property and that farmers are entitled to lifelong inheritable rights to the use of land. Land is not subject to sale or other means of exchange. Private individuals or legal entities can not sell land but may have a use right on the basis of a lease payment established by law.

A national land use policy is currently being drafted by the Ministry of Agriculture and is expected to coordinate subsector policies and activities which have an impact on land, such as agriculture, forestry, wildlife, mining etc.

#### **ii) Forestry Sector Policy**

In December 1994, the Ethiopian Forestry Action Program (EFAP) was prepared by the then Ministry of Natural Resources Development and Environmental Protection in a four volume report. The action program provides the basis for developing an appropriate policy at the Federal, Regional and local levels for environmentally sound management of the forest resources of the country. A Forest Management Policy is also under review and will soon be officially issued by the Government.

The Forestry Conservation, Development and Utilization Proclamation No. 94/1994 also embodies contemporary concepts and principles of resource management and can be said to be an ecosystem oriented type of legislation.

The proclamation contains important policy provisions relating to forest management, such as:

- state and regional forests can only be designated after consultations with and consent by farmers and subject to assurance of their benefits when eviction is likely;
- central and regional authorities are to facilitate conditions which will ensure the well-being of inhabitants within forests by making them beneficiaries from forest management as long as it is not contradictory to the objectives of forest development.

#### **iii) Wildlife Policy**

The Ministry of Agriculture has formulated a draft wildlife policy and strategy together with the related law and regulations governing wildlife conservation, development and utilization at the national level.

After consideration and review by concerned stakeholders in both the public and private sectors, it is expected that the policy, laws, and regulations will soon be issued.

The draft wildlife policy contains basic principles that are required at the federal and regional

levels for the proper management of the wildlife resources of the country and generally defines the responsibilities of the federal and regional governments to be translated into subsequent laws and regulations.

With regard to protected areas, there are two provisions which provide for the requirement of EIA: (i) all development activities within parks will be subject to an Environmental Impact Assessment and, (ii) in case of proposed developments outside protected areas, which could affect those areas, an Environmental Impact Assessment should be carried out and the results made public.

iv) **Other sector policies** being formulated by the responsible sectoral Ministries are:-

- Water Resources Policy /Ministry of Water Resources
- Biodiversity Policy/Ministry of Agriculture

### **Cross-Sectoral Policies**

Among the cross-sectoral policies that are of interest to the road sector EA are the National Population Policy and the National Policy on Ethiopian Women, both issued in 1993.

Among the relevant objectives of the national population policy are:

- Ensuring spatially balanced population distribution patterns, for maintaining environmental security and extending the scope of development activities;
- Improving productivity in agriculture and introducing off-farm non-agricultural activities for the purpose of employment diversification;
- Mounting an effective country-wide population information and education program addressing issues pertaining to the small family size and to its relationship with human welfare and environmental security.

The national policy on Ethiopian women has also three main objectives stressing that they must be part of all other policies, plans and laws. These are:

- Laws, regulations, systems, policies, and development plans that are issued by the Government shall ensure the equality of men and women. Special emphasis shall be given to the participation of rural women;
- Economic, social and political policies, programs and activities shall ensure the equal access of men and women to the country's resources and the decision making process and benefit fully from all activities carried out by central and regional institutions;
- Development institutions, programs and projects shall ensure women's access to and involvement in all interventions and activities.

Thus the country's policy framework for environmental management seems to provide an adequate policy basis for road sector EAs. It is, however, not yet clear how the environmental policies, both sectoral and cross-sectoral, will be translated into laws and regulations, how the responsible institutions will undertake such activities and be able to obtain the capacity to produce satisfactory EA and to incorporate such findings into designs and implementation plans, to monitor project activities, and evaluate their results.

## **2.2 Legal Framework**

The FDRE Constitution has the basic provisions for both the policy and legal foundation for appropriate subsidiary laws and regulations for sustainable managing the country's resources.

Among the powers and duties given to the EPA under the proclamation and relevant to the present study are:

- to prepare environmental protection policy and laws; and upon approval follow-up their implementation;
- to prepare directives and systems necessary for evaluating the impact of social and economic development projects on the environment; monitor and supervise their implementation;
- to prepare standards that help in the protection of soil, water and air as well as the biological systems they support, and follow up their implementation.

In line with the above cited powers and duties, EPA has already prepared two draft guidelines and regulations for EIA of development projects, and framework environmental legislation, which are under review both in-house and by other stakeholders, and are expected to be issued in the very near future.

The four draft documents under review are:

- Environmental Impact Considerations for Transport Sector Projects;
- Procedural Guidelines for EIA;
- Environmental Impact Assessment Regulations; and
- Framework Environmental Legislation.

### **Draft Sector Guidelines**

The sectoral guidelines for transport sector projects are designed to apply to the main modes of transportation: road, rail, and air transport. In the introductory part, they recognize that the country is set to speed up the improvement and expansion of the road network through the implementation of the RSDP, and therefore call for the need to establish an EIA system to assess the impacts of road sector activities to make the proposed projects environmentally sound and sustainable.

The guideline covers a comprehensive array of environmental factors that have to be considered by the relevant government agency or private sector in conducting EAs, and provides for the contents or elements that need to be considered in the EIA study. It categorizes projects that require an initial EIA, and those that require full EIA study; provides an EIA checklist for transport sector projects, and suggests a format for a terms of reference for EIAs of transport sector projects. The draft sectoral guidelines are still under review, and once finalized, it is expected that road sector development projects both existing and proposed undertaken by ERA, private contractors, and regions would follow the sectoral guidelines.

### **Procedural Guidelines for EIA**

The procedural guideline which is still in a draft form, has been prepared by EPA to serve as a guideline for both the public and private sectors engaged in development projects which require carrying out an environmental impact assessment. The guideline establishes a formal structure and process for carrying out assessments of environmental impacts of projects and their integration into the project cycle.

The Environmental Protection Authority or other regional agencies, defined as "competent agencies", are mandated to screen, review, decide and follow up existing and proposed development projects in the EIA process. Private and public entities, defined as "proponents", are responsible for conducting initial environmental assessment and EIA study which would be submitted to the competent agency for review and decision making. The Terms of Reference for conducting the EA are also to be prepared by the proponent, and the content of the TOR is also provided in the procedural guideline.

The ERA mandate covers the evaluation of the EA process of projects to be undertaken by federal

integration into the project cycle.

The Environmental Protection Authority or other regional agencies, defined as "competent agencies", are mandated to screen, review, decide and follow up existing and proposed development projects in the EIA process. Private and public entities, defined as "proponents", are responsible for conducting initial environmental assessment and EIA study which would be submitted to the competent agency for review and decision making. The Terms of Reference for conducting the EA are also to be prepared by the proponent, and the content of the TOR is also provided in the procedural guideline.

The ERA mandate covers the evaluation of the EA process of projects to be undertaken by federal agencies, or projects which are wholly or partially funded through the federal government, and also those projects to be implemented by federal permits, while projects not involving the federal government are to be evaluated by the respective agencies in regional states.

The procedural guideline has also categorized projects into two schedules. The projects within schedule 1 are those that may have significant environmental impacts and therefore require full environmental impact study, while projects listed in schedule 2 are those that have a potential to cause environmental impacts, but not likely to require environmental impact study, unless the initial EIA shows the need for a full EIA study. Major urban roads, new and upgraded motorways/express roads and rural road programs are included in schedule 1, while upgrading/rehabilitation of major rural roads are in schedule 2.

Both the sectoral and procedural guidelines for EIA are envisaged to constitute an integral part of the laws and regulations to be applied by all government agencies mandated to grant permits for implementing projects.

#### **Environmental Impact Assessment Regulations**

Draft Environmental Impact Assessment Regulations are also under preparation by the EPA, and envisaged to be issued by the Council of Ministers, which has the mandate to approve and issue such regulations. The regulations are expected to apply to all existing and proposed projects in both the public and private sectors.

The salient feature of this regulation is that no public or private sector projects, which are likely to have a significant environment impact, can be undertaken or authorized without prior consideration of their impacts on the environment. This follows from the regulations and criteria established by relevant guidelines and standards, which are also to be issued by the EPA, as stated earlier.

The regulations provide the elements for determining whether a project is likely to have a significant environmental impact, and provide an opportunity for stakeholder participation in the decision-making process.

The environmental assessment process usually includes screening, scoping, environmental impact study, review of the environmental impact statement, and implementing a follow-up program.

The project would be screened by the 'competent agency', which is the Environmental Protection Authority, or a regional agency mandated to do this. A time limit has not been fixed as to when the decision on project acceptability and the type of possible EA needed would be made by the competent agency in project screening. The time limit for decision making is an essential element, because a project may be unduly postponed unless the EPA, or the regional agency delegated to screen a project, is obliged to give its decision within a fixed period. A time limit has also not

been fixed as to when the decision during full review is to be made, of the acceptability of an environmental impact study undertaken by the concerned public or private agency. This issue was raised by the Consultant during consultation with specialists from EPA, and the latter has recognized the need for providing a fixed time within which EPA or another competent agency should make decisions during the screening and review processes.

Another important feature of the regulations is the provision of a surveillance process whereby the competent agency (EPA or the mandated regional agency) is empowered to make periodic monitoring or surveillance to ensure compliance with the requirements of the regulations and other relevant legislation.

The draft EIA regulations have further detailed provisions for the EIA process in the project cycle, and also provide for enforcement and sanctions.

### **Framework Environmental Legislation**

EPA is in the process of drafting framework environmental legislation to form the basis for all subsidiary environmental regulations, directives (guidelines), and standards, including those relating to Environmental Impact Assessment as discussed above. A workshop will be held in September 1997 for relevant sectoral agencies and stakeholders to discuss the draft legislation. It is expected that the framework environmental legislation will be issued soon.

### **Assessment of the Legal Framework**

The draft legal framework being developed in Ethiopia for the environmental assessment of development projects covers a more or less adequate and detailed set of laws, regulations and guidelines. These can serve as a framework for conducting EAs in both the public and private sectors once adopted by the Government.

The documents have been subject to discussion or will be discussed by all relevant stakeholders, usually in workshops, to incorporate the ideas of the stakeholders before they are issued. The regulations and guidelines also seem to have taken account of the key elements in EU and World Bank guidelines.

Some issues in the guidelines and regulations may require further attention:

- the regulations and guidelines need to be reviewed as a whole, in order to ensure their mutual compatibility;
- a time limit should be provided within which EPA or the competent agency give their decision in the screening of a project or reviewing its environmental impact study. Otherwise, the screening or review processes may slow down project implementation;
- the guidelines prepared by EPA require the approval of the Environmental Council. As the Environmental Council does not function yet, the legal status of the guidelines will be weak, only that of optional guidelines;
- The Ethiopian Roads Authority should adopt the national EA guidelines and regulations, but may also define more specific procedural guidelines for its sectoral activities, for inclusion in contractual documents;
- the most important issue to be addressed with respect to the legal framework is how to make it implementable. This involves the building of capacity within ERA so that it will be able to incorporate the EA process in all road sector projects from planning to implementation. The Environmental Protection Authority should also increase its capacity of adequately screening, reviewing and monitoring EAs conducted by sector agencies, once the regulations and guidelines are issued, because it may otherwise be overburdened with demands from sector agencies both at the federal and regional level.

## **2.3 Road Sector Organizational Framework**

### **Responsibility for Road Network Development**

The responsibility of implementing the RSDP which spans over ten years is mainly divided between the Ethiopian Roads Authority (ERA) and the Regional Government Rural Road Organizations (RGRRO).

ERA, as the organ of the federal government, is responsible for the overall planning of national network development and maintenance, and the construction of trunk and major link roads, while the responsibility for rural road construction and maintenance has been decentralized and given to the RGRROs in the regional states.

ERA's relationship with the regional agencies is mainly that of giving advice and technical assistance. For this purpose it has a Rural Roads Division.

### **Optimizing the Environmental Impact of Road Development**

In order to adequately address the environmental impacts of the projects under the RSDP, meeting national requirements, both ERA and the regional agencies have to strengthen their capability to carry out environmental assessment from project planning to implementation.

In the past, apart from routine engineering requirements, little attention was given to incorporating environmental considerations into road sector activities. However, due attention has been given to environmental impacts in the RSDP, and the need for capacity building in the sector, both at the federal and regional levels. In line with this, the new organizational structure of ERA includes an Environmental Management Branch, which is expected to be responsible for carrying out EAs of road sector activities.

The Environmental Management Branch, in the new organizational structure of ERA, is placed under the planning and programming division of the engineering and regulatory department, headed by deputy general manager (Appendix 9).

The need for an environmental unit within ERA is justified by the huge task facing ERA as the program coordinator of the RSDP, adding to its responsibility for the overall planning of national road network development. The overall environmental management of road sector activities, carrying out or commissioning the EAs, ensuring the incorporation of EA findings into design and mitigation plans, and supervising their implementation, call for the establishment and adequate staffing of an Environmental Management Branch.

Three main tasks are envisaged for the Environmental Management Branch. Firstly, the environmental unit would have a role in advising the top management and assisting it in decision making on all road sector environmental issues, institutional and others. Secondly, it would have a coordinating role for ensuring that environmental issues are incorporated in the activities of all other ERA departments and divisions. It could also play the role of a focal point for coordinating cross-sectoral environmental issues and ensuring their incorporation into the EA process. Thirdly, the environmental unit will be responsible for carrying out or supervising actual EAs.

For the above overall responsibilities, having the Environmental Management Branch under the planning and programming division which is accountable to the DGM of the engineering and regulatory department, seems well placed. The DGM is close to top management and therefore has access for reporting and advising the General Manager on all environmental issues. Importantly, the Environmental Management Branch is placed directly under the planning and



programming division, which is responsible for supervising all road sector programs and plans, for overall supervision and follow up. Consequently, the Environmental Management Branch would have adequate opportunity to participate, evaluate and follow-up all activities in all phases of the planning process, and ensure that EA has been incorporated into all RSDP sub-project plans.

The Environmental Management Branch will, on the basis of the laws, regulations, and procedural and sectoral guidelines, initially in draft form and eventually finalized for the EPA mandate, ensure that the national requirements in the road sector development programs are met. More specific guidelines can be developed within the national requirements and will be dealt with further in this study.

### **The Road Sector in Cross-Sectoral Coordination**

At the federal level, EPA is the body responsible for ensuring that public and private entities in all sectors, engaged in development activities, adequately consider environmental concerns in their planning, project development, implementation, operation and maintenance. EPA also requires them to undertake adequate monitoring and enforcement activities.

EPA is, according to its mandate, responsible for preparing the Policies, Guidelines and Regulations to be deliberated and decided by an environmental council (explained below). Therefore, during the preparation there is a need for regular cooperation between EPA and the sectoral Authorities, both at Federal and Regional level. At this time, when the environmental guidelines for different sectors and the regulations for EA procedures are being under preparation, it is utmost important to establish the form of cooperation between different administrative and private stakeholders and also establish the forms of public participation. For the time being, EPA is carrying out the participation through workshops and seminars among involved parties.

EPA should also be in a position to deal with cross-sectoral environmental issues and coordination so that all sectoral programs and sub-projects are integrated and incorporated at all stages of the EA process. This will also assist it in the monitoring and follow-up of all sectoral activities.

To deal with cross-sectoral issues and coordination, EPA has an Environmental Council composed of:

- An official to be designated by the Government, as the Chairperson
- The Minister of Agriculture
- The Minister of Trade and Industry
- The Minister of Health
- The Minister of Mines and Energy
- The Minister of Water Resources
- The Science and Technology Commission, and
- The General Manager of EPA

According to the Proclamation 9/1995 the Environmental Council of the Environmental Protection Authority is an Environmental Council dealing with cross-sectoral environmental issues and cooperation in the country. However, the Council is not yet active. The Council would decide upon the overall guidelines on cooperation, responsibilities concerning e.g. mitigation and monitoring of infrastructure programs.

The mandate of the Council also includes (i) deliberating upon policy matters concerning environmental protection, and (ii) making recommendations, and (iii) evaluating and approving directives and standards to be issued by EPA.

Although most relevant sector agencies are represented in the Environmental Council, there is no representation of the road sector. Dealing with the overall environmental issues of this sector would benefit from having a member of the Board of ERA represented in EPA's Environmental Council. Currently, ERA board is composed of the Minister of Economic Development and Cooperation (Chairperson), Ministers of Works and Urban Development, Transport and Communications, two representatives from the Prime Minister's Office, and the General Manager of ERA.

It would also be necessary that cross sectoral cooperation be made at the technical level. This could be in the form of a technical committee in which specialists from each sector can be represented, and cross-sectoral environmental issues and activities are discussed. The focal points for this type of technical committee can be the environmental units established or planned within sectoral agencies, such as the one in ERA, and participation can also be extended to representatives of the private sectors.

At the regional level, there are Regional Environmental Coordinating Committees already functioning, chaired by the Vice President of the regional state and with representatives of relevant bureaus. These can serve as coordinating committees, and liaise with EPA at the federal level. Corresponding committees have also been established at local levels.

In the EA-process, ERA can coordinate its activities with the environmental coordinating committees at the regional, woreda, and local levels, so that the environmental concerns at all levels can be incorporated. Moreover, public consultations, which are an important part of the EA process, can also be organized by the coordinating committees, with which ERA can make the necessary contacts.

#### **Environmental Management Branch in ERA**

At present, the Environmental Management Branch in the Planning & Programming Division of the Engineering & Regulatory Department of ERA has not started operating. The Branch would be specialized in environmental impact issues (see the organization of ERA in Appendix 9). The mandate for the unit is derived from the functions proposed for ERA in the reform of the entity.<sup>1</sup> These include *"studies on the effects/impacts of road construction on the environment, especially utilization of natural resources, and making recommendations to avoid harmful effects."* The Division also reviews and appraises proposed projects, makes recommendations based on their feasibility studies and analyses of their socioeconomic benefits.

The location and manning of this Environmental Management Branch is examined below, on the basis of three main tasks planned for the unit. First, the unit should be close to the top management to be able to assist the management in decision-making and institutional issues concerning environmental management. Secondly, the unit should have the position to be able to guide, control and assist all the other departments in environmental activities. Thirdly, the manning of the unit is outlined to perform and supervise actual EAs.

The approach to the issue seems reasonable enough. The Department is headed by a Deputy General Manager and therefore the Environmental Management Branch has a straight access to

---

1. May 1997. Reform Study Report. Revised Summary. Draft, Ethiopian Roads Authority, Federal Democratic Republic of Ethiopia, Addis Ababa. 113 p.

top management. All planning (programming, network planning and planning and design of individual road projects) is taking place in the Planning and Programming Division. Consequently, the Environmental Management Branch has the possibility to participate, evaluate and give comments (and requirements) in each phase of the planning process. And, furthermore, all the other units in ERA are responsible for reporting of their activities through the Planning and Programming Division. Given the opportunity to reviewing this reporting, the Environmental Management Branch can develop the environmental management of all activities in ERA and also in the RGRROs.

The procedure and contents of EAs will be quite well guided after finalizing the legislation and regulations for EAs in the country. And, furthermore, most of the projects requiring full EAs, if not all in the beginning, are to be planned and designed by consultants. Thus, this would leave the supervision role to the Environmental Management Branch of ERA. This does not decrease the need for proper training for the staff of the unit. Nevertheless, it leaves the possibility to concentrate on other, also very relevant, environmental issues of the road sector.

There will most probably be only a few projects requiring full EAs during the implementation of the RSDP. Apart from these projects, road sector activities cover a wide range of operations which are often, unconsciously, regarded as of minor significance to the environment. However, these actions, left without attention, cause probably more damage and irreversible changes to the environment than can be expected from those large road projects.

Therefore, one main aspect establishing the Environmental Management Branch within ERA has to be managing comprehensively the environmental issues of road sector. To start with, it means promoting awareness of environment at all levels of ERA. Secondly, it means integrating environmental attitudes, methods and arguments into all activities, including decision-making. From methodological point of view, this means integrating Environmental Management System into the overall Quality Control System of the Road Sector. Even if creating an Environmental Management System in practice might not be the first actions to be taken by the unit, expanding the coverage of good environmental management is the goal to reach for.

#### **ERA Environmental Management Branch Staffing and Staff Development**

The Consultant recommends five specialists for the unit: EA Manager, Engineering Specialist, Hydrogeologist, Ecologist and Sociologist or Socio-Economist. Most of the tasks of the unit would be carried out through team work, and the Unit should have access to complementary resources from other ERA entities, as needed. The tasks listed under each job description are those for which the incumbent would be responsible.

The Environmental Assessment Manager is responsible for the following main tasks:

- Representative of ERA in the technical Committee of Environmental Cooperation
- Supervises environmental impact optimization in ERA policies, and program, project, and action plan preparation
- Adviser to ERA top management on environmental issues
- Environmental Assessments in ERA projects, supervising Consultants or directing ERA EAs
- Training ERA and RGRRO staff in environmental issues
- Directs ERA in environmental monitoring as well as research & development activities
- Follow up the international development in the field and apply it to ERA

The Engineering Specialist's main tasks are:

- Advice and modelling related to environmental risks and solutions in road alignment, design and maintenance
- Environmental impact assessment and monitoring of implemented road engineering solutions
- Environmental engineering specialist in preparing road plans and designs
- Adviser in environmentally friendly solutions to road construction and maintenance
- Training ERA and RGRRO staff in the incorporation of environmental issues in road design

Hydrogeologist's main tasks:

- Specialist in erosion control and the stabilization of the physical road environment
- Specialist in the hydrological and geological issues of road and bridge alignment and design as well as bioengineering
- Training ERA and RGRRO staff in hydrological, geological, and soils issues of the physical road environment
- Accident risks, chemical hazards

Ecologist's main tasks:

- Specialist in aligning roads to mitigate adverse biological and ecological impacts
- Adviser in road related ecological issues
- Training ERA and RGRRO staff in ecological environmental optimization and problem-solving

Sociologist's/Socio-economist's main tasks:

- Specialist in assessing and optimizing the social impacts of roads
- Specialist in arranging public participation and hearings related to road development, operation, and maintenance
- Specialist in land use issues/resettlement aspects
- Developer of entity cooperation in road related organizational issues
- Training ERA and RGRRO staff in identifying and optimizing issues of the social environment
- Monitoring and evaluation

## 2.4 Training

### Training Needs of the Environmental Management Branch Personnel

It is assumed that the persons appointed to the Environmental Management Branch of ERA are trained professionals with some environmental training and background (as described in the Table in the executive summary of this report). Depending on their background there may be a need for further environmental training. The training requirements shall be further assessed, once the personnel has been appointed.

There are training courses on EIA arranged in various institutes in Europe, for example the EIA Center of the University of Manchester in UK and the Institute for Housing and Urban Development Studies in Rotterdam, the Netherlands. EIA training can also be obtained Canada. These (and also other) countries and institutes arrange also tailor made courses for groups. Also in Nairobi, Kenya, the African Institute of Technology has arranged courses in EIA.

The length of the courses vary from few days to one year or more. The Consultant assumes that 1,5-3 months training could be suitable as additional training for the Personnel of the

Environmental Management Branch. The needs of different persons may also be different. There are specific training programs in EIA, strategic EIA, social impacts assessment etc. To guarantee the early functioning of the Environmental Management Branch, it should be seen that all the Branch personnel is not going for training at the same time. It is suggested that the training takes place during the first two years. For example, during first year two (2) and the second year three (3) persons would be sent for training.

The EIA development is fast, and it is therefore important that **continuous** training takes places among the ERA staff, especially the personnel of the Environmental Management Branch and the persons in charge of environmental issues in the ERA districts.

#### **Training Needs of Other ERA Personnel**

Since all the financing organizations are nowadays demanding environmental assessments before any project approval, all the personnel of ERA on the planning and decision making level as well as the implementation, operation and maintenance level should be given some kind of environmental awareness training, which can be organized as workshops or short training courses.

Both awareness and action oriented training shall be given to the ERA's district level staff and operational and maintenance groups. The training can be organized as in-house training for example in the Alemgena or Ginchi training centers of ERA.

The in-house training could be given by the personnel of the Environmental Protection Branch of ERA. Additional trainers can be hired from for example EPA.

It is recommended that each ERA District Office would appoint and train a person in charge of environmental issues. These persons could be either trained in special training courses (e.g. abroad) or as in-house training.

The in-house environmental training for the ERA's personnel shall be organized through the Human Resource Development Division of ERA, which is in charge of formulation of policies and procedures of human resource planning and development, and ensuring that additional requirements of training are met.

The training topics may include the following:

##### For management level

- environmental issues of road sector
- environmental management system
- environmental leadership

##### For engineering level

- environmental issues of road sector (all)
- environmental management system (all)
- EAs: legislation, purpose, contents, procedures (project managers in planning)
- public participation in planning and design process (project managers in planning and design)
- abilities as a public performer and communication skills (project managers in planning and design)
- environmental aspects in planning and design (project managers, planners and designers)
- equipment and machinery (procurement staff)

For maintenance and construction staff

- environmental issues of road sector, emphasis on maintenance (construction) issues (all)
- environmental management system (district managers and deputies)
- specific issues: workshops, machinery, waste, recycling and re-use of materials, salvaging of waste oils, dissolvents etc, safety at work, traffic safety, smooth driving, saving of energy, quarries, crushing plants, asphalt plants, borrow pits.

## 2.5 Cost Estimate for the Environmental Management Branch of ERA

The total cost for the Environmental Management Branch of ERA for the period 1997/98-2001/02 is about Birr 3.5 million consisting mainly of the salaries and allowances for the staff (5 persons) as well as purchase of vehicles and office and other equipment. In addition, training costs of the staff is estimated.

Cost Estimate for the Environmental Management Branch for 1997/98-2001/02		
	Total Cost (Birr)	Possible Financier
Salaries and Peridiems	810 000	GOE
Equipment		
* 2 Vehicles	600 000	GOE
* Techn. Equipm.	50 000	EC
* Office Equipment	52 000	GOE
Training	595 000	EC
Running Costs	1 350 000	GOE
<b>Total</b>	<b>3 457 000</b>	<b>GOE 2 812 000</b> <b>EC 645 000</b>

The costs of vehicles (two double cabins; one 4x4 and one 2x4) are estimated to be Birr 350,000 and 250,000 respectively.

The set of technical equipment comprises two sets of survey equipment (GPs) (Birr 5,600), two sets of binoculars (Birr 2,100), water and soil sample kits (Birr 17,500), one camera (Birr 2,800), five engineer's clipboards (Birr 1,750), two calculators (Birr 700) and other discipline specialty equipment.

The training comprises training of the five staff members abroad and in-country (Birr 105,000 per person for abroad and a lump sum of Birr 35,000 to conduct in country training)

### **3 OVERVIEW OF PROPOSED SECTOR PROGRAM**

#### **3.1 Background and Justification**

The Ethiopian Roads Authority (ERA) has prepared a Road Sector Development Program (RSDP, second draft, January 1996) which outlines the sector development till 2007. At the background of the programme is the present economic reform based on Agricultural Development-Led-Industrialisation (ADLI) strategy of the Government. In accordance with the ADLI strategy several policies of adjustment and economic growth are being implemented in the country. These include decentralization, fiscal reform, agricultural reform, shifting to market economy and private sector mobilization.

Various efforts made to transform the state-controlled economy of Ethiopia into a market economy and to encourage private sector participation in the national development have started to show promising results. For example, the GDP growth, which was negative in the beginning of 1990's has shown drastic change to notable positive figures from the fiscal year 1992/93. Also the private sector investments have started to increase over the last few years. These positive signs clearly suggest that the undertaken policy measures have been adequate.

All transport modes in Ethiopia have suffered great damages during the last decades due to the war, diversion of resources from productive activities to military purposes, and also due to unsuccessful economic policies and the effects of drought. Ethiopia's transport services are also not sufficient in relation to the size of population and geographic area of the country. Furthermore, the distribution of transport services is not regionally balanced.

The scattered pattern of settlement and economic activities in Ethiopia makes well functioning transportation system a prerequisite for economic development. Furthermore, in such circumstances a road network has been and will be the backbone of the transportation system. Growth in agricultural output, which is visioned as the primary basis for the development in the country, is dependent on an efficient road transportation system integrating the rural communities with urban centres, and further to facilitate cost efficient transport of export crops to the ports.

Road density in Ethiopia is among the lowest in Africa and other developing countries, with 21 km of road per 1000 square km and 0.43 km of road per 1000 population. According to the RSDP there are currently 23812 km of trunk roads, major link and regional roads. Out of 8180 km of trunk roads 3478 km are paved and the rest have gravel surface. Major link roads constitute 7589 km out of which just 178 km are paved. Regional roads in total 8043 km are of variable standards. There are also roughly 30000 km of unclassified, low standard earthen tracks and trails.

The facts that only 11 % of paved roads and 19 % of gravel roads are presently in good condition and 48 % and 54 % in poor condition, respectively, demonstrate the unacceptable status of the road network. In comparison with other African countries the road condition in Ethiopia is among the worst ones. Accordingly, RSDP puts strong emphasis on rehabilitation and maintenance of the existing road network.

#### **3.2 Strategy and Policy Reform**

The Government of the Ethiopian Federal Democratic Republic, in recognition of the critical state of the transport sector creating serious problems for the economic development of the country, through its implementation authority, ERA, has launched a sectoral program for developing the national road network (RSDP). The program is unique in its approach and

strategy, and addresses the following key issues:

- The aging of the network as a whole;
- The limitation of the network in terms of both coverage and quality;
- Lack of capacity and competitiveness of the private road sector contractors and consultants;
- Road safety is a major problem in the country;
- Environmental impacts of road projects have not been properly assessed in the past
- Controlling and enforcing axle load legislation;
- Strengthening the use of labor based road construction and maintenance;
- Identifying and implementing means and modes of rural transportation;
- Network planning approach for the road system;
- Training needs for capacity building in the ERA and RGRRO.

In line with these issues, major goals for the RSDP are derived from the urgent need for socio-economic development of the country. The goals consist of (1) improving transport operating efficiency and reducing road transport costs for both goods and passengers in order to encourage production, distribution and export, (2) providing access to rural, other neglected and food deficiency areas to support efficient production, exchange and distribution throughout the country and to exploit the utilization of the vast natural resources of the country, and (3) developing institutional capacity of the road sector at central and regional levels. The goals will be addressed through the following measures:

- Rehabilitating and upgrading the existing road network;
- Constructing new regional and major link roads;
- Establishing road funds adequate for road maintenance;
- Enhancing the road construction and maintenance capacity of the private sector;
- Improving road safety;
- Reducing the adverse effects of road construction and maintenance on the environment;
- Strengthening and enforcing axle load regulation;
- Promoting labor based road construction and maintenance;
- Providing community based integrated village travel and transport services;
- Acquiring equipment for road construction and maintenance by establishing commercially operated plant pools;
- Strengthening the capacity of Federal and Regional road administration;
- Improving staff capability and capacity by training and technical assistance programs; and
- Developing planning and programming based on a network stabilization program.

### 3.3 Environmental Implications

The RSDP provides a comprehensive approach to integrating the implementation of key road investment with major policy and institution reforms. The program covers the period 1997 to 2007, divided into two five-year phases. It outlines plans to improve the condition of the existing network by extensive rehabilitation and upgrading, and substantial expansion of rural roads network. In addition to physical targets the RSDP focuses e.g. on institutional development, priority setting of investments, labour based technology, road safety, control of vehicle axel loads and environmental issues. As such the RSDP is one of the basic instruments of the Government in the implementation of ADLI approach in the national and regional development. However, the RSDP is an ambitious program for a relatively short time period, and the success from environmental sustainability point of view will mainly depend on the progress in institutional development. In this regard capacitation of the Environmental Management Branch of ERA is the key issue.



The RSDP is formulated in such a way that it will deal with the issues of competing investment demands between restoring the existing network and extending the network into areas currently not served by roads. To allocate investments in an optimal way between the two is a fundamental consideration of the program, since the current road network is limited both in terms of coverage and quality. The necessity to extend the road network to support the development efforts of the country is beyond doubt. At the same time preventing the existing network from further deterioration is the most crucial matter. Accordingly, the RSDP gives high priority to maintenance and rehabilitation works as well as to upgrading the standard of trunk roads and major link roads. The existing network would be expanded by constructing new regional roads and major link roads if network stability and economic development assessment justify it at regional or national level.

A general priority setting mechanism at RSDP level on environmental grounds is not seen possible by the Consultant. It is possible to compare two or more specified projects (roads) based on environmental impacts, but this requires setting of weightages for different issues, and setting of numerical measuring principles for various impacts, which are difficult in a manner acceptable to all interest groups. Importance (weightage) of various issues also varies from case to case. Similarly it is impossible to define 'environmental costs' or 'benefits' comparable with financial inputs. Because of these difficulties the environmental assessment should not be expected to solve prioritization problem. However, it helps to identify and cancel environmentally hazardous projects as well as the environmentally sound projects for further planning, design and implementation.

The strong emphasis on rehabilitation and maintenance of existing road network is in general a positive environmental implication of the RSDP. Adverse impacts of road rehabilitation on the natural environment are less compared with a new road. Similarly, potential erosion hazards are far more critical when planning and constructing new roads.

## **4 CRITICAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **4.1 General**

The most critical environmental issues, impacts and mitigating measures and monitoring, associated with RSDP projects are discussed below. This does not mean that in the individual road projects the EA could be limited to these issues.

All the road projects need either a full EIA process or an initial environmental assessment. All the potential impacts shall be assessed. For this purposed the check lists developed by e.g. the World Bank are useful basic tools. Later once more in-country experience is accumulated by ERA, more specific checklists and further guidelines can be developed for the Ethiopian conditions.

### **4.2 Physical Environment: Erosion Hazards**

#### **Environmental conditions**

The road sector development program (RSDP) will have to address opportunities and challenges in the highly diverse physical environments of Ethiopia:

- the large variety of geological, soil, topographic, surface and groundwater hydrological conditions;
- the large variety of physiographic divisions: the central lava highlands of the south-western, south-eastern, north-western and Harar Plateau; lava, sedimentary and crystalline rocks of northern plateau, the Ethiopian Rift Valley floor, the transitional scarp and the western and south-eastern lowlands;
- a wide range of topographic conditions: hilly, rolling, undulating, plain and dissected areas, with elevations varying from below sea level to some 3000 m.a.s.l., excluding the highest peaks. Some of the roads are aligned along a watershed divide, while others traverse highly dissected terrain, flat lands, etc. Runoff and erosion risks are especially high on steep slopes in the highlands;
- numerous river crossings: Abbay, Tekez, Awash, Wabi Shebelle, Omo, Baro, and many smaller ones. The roads cross all the major rivers and their tributaries in the country radiating from the central highlands of Ethiopia. The rivers and streams crossing the roads have high floods during the main rainy season (June-September) and minor floods March-May during Belg season;
- a high variety of geological, soil, and geomorphological conditions: recent sedimentary and volcanic formations, tertiary volcanic rocks, Mesozoic sedimentary (limestones, sandstones and shales), Precambrian rocks (meta-sediments and metavolcanics); major tectonic zones in the Rift Valley; residual, alluvial, swampy soils, bare lands of hilly mountains; rolling and undulating hilly plains, plains of different geological formation;
- variability in groundwater conditions, in terms of water table depth and fluctuation; the levels, distribution, and abundance governed by the geological formation, topography, geomorphology, tectonic features, and climate: confined and unconfined, fractured and intergranular, the static water level varying from a few meters to over 100 meters;

PROPOSED ROAD UNDER RSDP  
TRUNK ROAD

- |                             |                        |
|-----------------------------|------------------------|
| Phase 1                     | Phase 2                |
| Asphalt Upgrading Road      | Asphalt upgrading Road |
| Gravel upgrading Road       | Gravel upgrading Road  |
| Asphalt Rehabilitation Road |                        |

MAJOR LINK ROAD

- |                        |                        |
|------------------------|------------------------|
| Phase 1                | Phase 2                |
| Asphalt upgrading Road | Gravel upgrading Road  |
| Gravel upgrading Road  | Asphalt upgrading ROAD |

NEW CONSTRUCTION MAJOR LINK ROAD

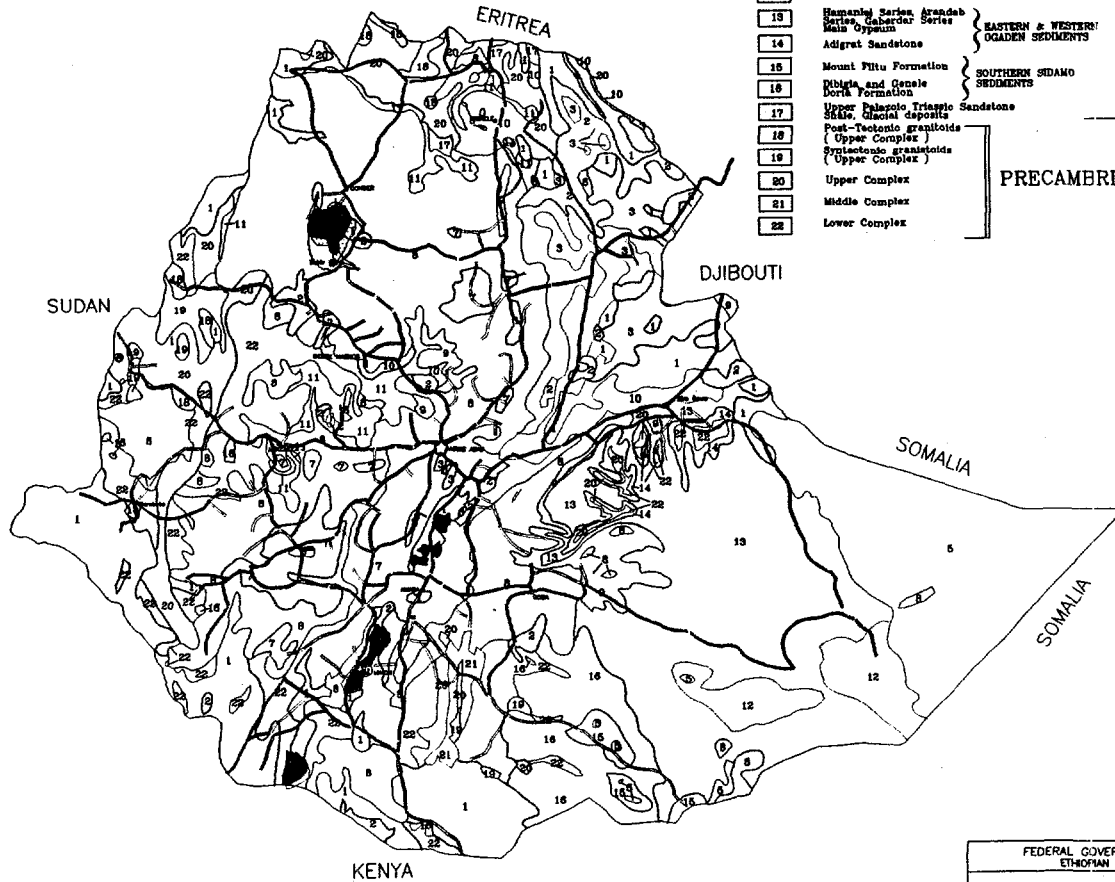
- |                  |                  |
|------------------|------------------|
| Phase 1          | Phase 2          |
| New Construction | New Construction |

ALL WEATHER ROADS

- |             |         |
|-------------|---------|
| Paved Road  | Gravel  |
| Gravel Road | Railway |

LEGEND

1	Quaternary Sediments	} QUATERNARY VOLCANICS	CENOZOIC	
2	Basaltic flows and related Spatter Cones			
3	Basaltic intermediate and felsic Volcanic			
4	Dogali Formation, Damot Formation			} TERTIARY SEDIMENT
5	Dululito Formation, Red Sea Series			
6	Jawra Sandstone, Arada Series, Taleh Series, Karkar Series			
7	Alkaline Granite and Syenite			} TERTIARY VOLCANICS
8	Magdala Group			
9	Trap Series			
10	Ambe Aradam Formation	} CENTRAL PLATEAU SEDIMENTS	MESOZOIC	
11	Antalo group			
12	Adigrat Sandstone			
13	Gumburo Series	} EASTERN & WESTERN OGADEN SEDIMENTS		
14	Haramula Series, Aradab Series, Main Ogaden			
15	Adigrat Sandstone			
16	Mount Filtu Formation	} SOUTHERN SHAWO SEDIMENTS		
17	Dibiga and Genshe Dorka Formation			
18	Upper Paleozoic, Triassic Sandstone			
19	Stellate, siliceous deposits			
20	Post-tectonic granitoids (Upper Complex)	} PRECAMBRIAN		
21	Stylotectonic granitoids (Upper Complex)			
22	Upper Complex			
23	Middle Complex			
24	Lower Complex			



FEDERAL GOVERNMENT OF ETHIOPIA  
ETHIOPIAN ROAD AUTHORITY

THE ENVIRONMENTAL IMPACT ASSESSMENT OF THE ROAD SECTOR

PLANNING UNIT (P.U.)

GEOLOGICAL MAP

Figure 4.1 | Date

PROPOSED ROAD UNDER RSDP  
TRUNK ROAD

- |                          |                               |                          |                         |
|--------------------------|-------------------------------|--------------------------|-------------------------|
| Phase 1                  |                               | Phase 2                  |                         |
| — Asphalt Upgrading Road | — Gravel upgrading Road       | — Asphalt upgrading Road | — Gravel upgrading Road |
| — Gravel upgrading Road  | — Asphalt Rehabilitation Road |                          |                         |

MAJOR LINK ROAD

- |                          |                         |                         |                          |
|--------------------------|-------------------------|-------------------------|--------------------------|
| Phase 1                  |                         | Phase 2                 |                          |
| — Asphalt upgrading Road | — Gravel upgrading Road | — Gravel upgrading ROAD | — Asphalt upgrading ROAD |
| — Gravel upgrading Road  |                         |                         |                          |

NEW CONSTRUCTION MAJOR LINK ROAD

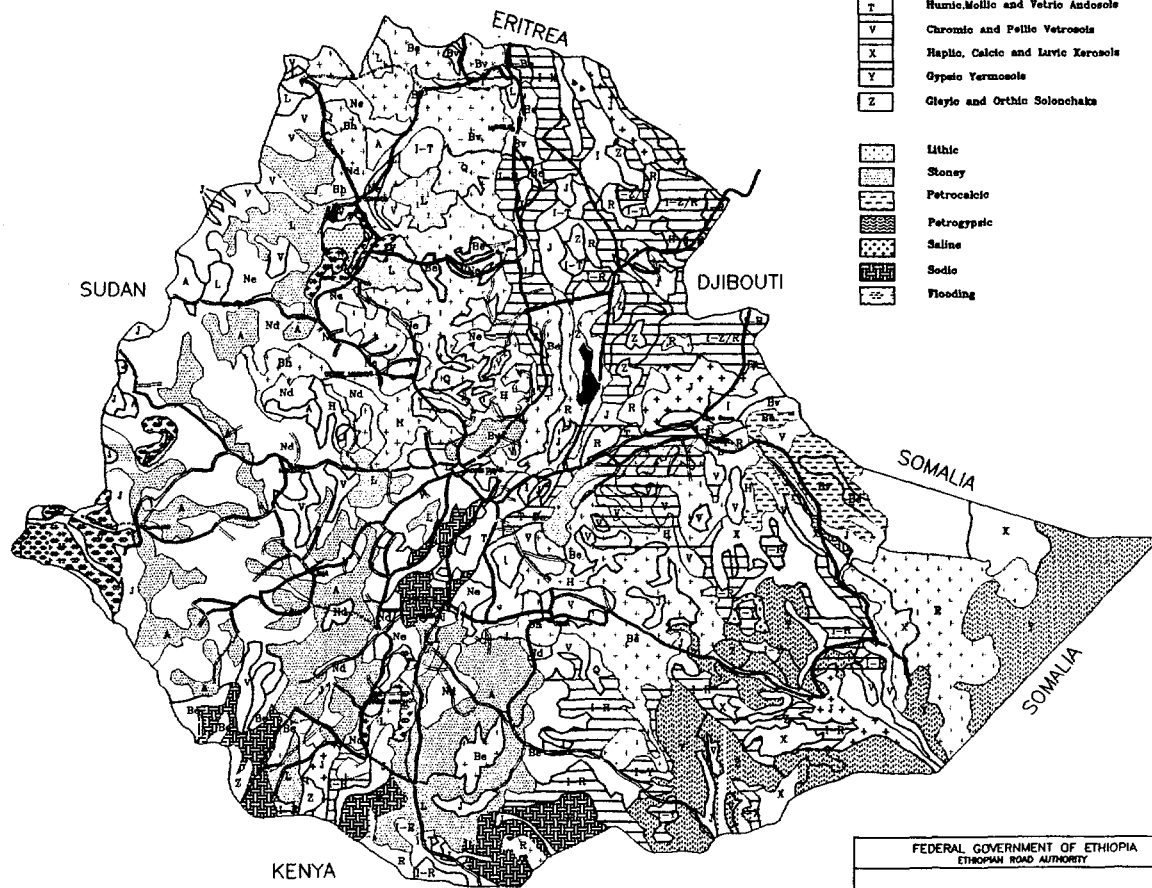
- |                    |  |                    |  |
|--------------------|--|--------------------|--|
| Phase 1            |  | Phase 2            |  |
| — New Construction |  | — New Construction |  |

ALL WEATHER ROADS

- |               |           |
|---------------|-----------|
| — Paved Road  | — Gravel  |
| — Gravel Road | — Railway |

- |    |                                       |
|----|---------------------------------------|
| A  | Orthic Aridisols                      |
| Bu | Chromic Eutric and Calcic Cambisols   |
| Bh | Dystric and Humic Cambisols           |
| Bv | Vetric Cambisols and Vetric Luvisols  |
| K  | Rendzinas, Haplic and Luvic Phaeozems |
| L  | Lithosols                             |
| J  | Calcic and Eutric Fluvisols           |
| L  | Chromic and Orthic Luvisols           |
| Nd | Dystric Nitosols                      |
| Ne | Eutric Nitosols                       |
| Q  | Cambic Arenosols                      |
| R  | Calcic and Eutric Regosols            |
| T  | Humic, Mollic and Vetric Andosols     |
| V  | Chromic and Fellic Vertisols          |
| X  | Haplic, Calcic and Luvic Kerolosols   |
| Y  | Gypsic Vertisols                      |
| Z  | Gleyic and Orthic Solonchaks          |

- |           |             |
|-----------|-------------|
| [Pattern] | Lithic      |
| [Pattern] | Stoney      |
| [Pattern] | Petrocalcic |
| [Pattern] | Petrogypsic |
| [Pattern] | Saline      |
| [Pattern] | Sodic       |
| [Pattern] | Flooding    |



FEDERAL GOVERNMENT OF ETHIOPIA ETHIOPIAN ROAD AUTHORITY	
THE ENVIRONMENTAL IMPACT ASSESSMENT OF THE ROAD SECTOR	
PLANCENTER LLC, FINLAND	
SOIL MAP	
Figure 4.2	Date

- large climatic and hydrological differences: humid, temperate, semi-arid to hot-arid. The seasonal variation in climate is governed by the oscillation of the Inter-Tropical Convergence Zone (ITCZ). The mean annual rainfall varies from more than 2000 mm to less than 300 mm. Climate is the principal factor of the hydrology of the area. Peak floods occur during the main rainy seasons. Areas with high rainfall have numerous perennial and seasonal rivers. As rainfall decreases, the number of perennial rivers decreases; and
- seismicity and earthquakes; the most seismically active zone is the Rift Valley. Road sections crossing the Rift Valley should consider seismicity in the design of hydraulic structures and bridges.

### **Erosion Hazards**

One of the most important issue of environmental impacts in a road project is soil erosion. Erosion is a function of the stage of construction (rehabilitation/ upgrading and new construction) and the physical environmental condition (geology, climate, soil, topography and surface and groundwater hydrology). Erosion with road construction is often associated with unstable geological conditions in a form of landslides, which can be a natural phenomena or caused by human activities (e.g. blasting of road cuts in critical slopes). Sheet and rill erosion and formation of gullies happen both naturally but is also highly accelerated by road construction if fresh soil slopes are not properly and timely protected and if drainage arrangements are not efficient. River bank scouring during peak runoffs and floods is also a serious erosion risk which may threaten roads along rivers or bridges and other structures crossing rivers.

The roads according the RSDP can be classified by the stage of construction as

- a) Rehabilitation and upgrading which have less adverse impacts during construction and more positive impact after construction compared to the existing roads. Man made geological hazards are smaller as the alignment of rehabilitated roads mainly follow the existing one. Furthermore, the critical sections can be easier recognized by past experience along the road. Improving the technical standard with e.g. appropriate drainage, slope protection and other measures to control sheet and rill erosion will rather decrease erosion along existing roads than cause any hazards and risks. River bank scouring problems are also largely eliminated by careful selection of river crossing sites and proper engineering in rehabilitation projects.
- b) New construction which may have severe, moderate or no impacts during construction and exploitation depending on the local conditions. Cutting roads and filling embankments in erosion sensitive areas is a major concern calling for careful engineering design and immediate protection measures of exposed slopes. Blasting and other cutting in slopes may cause landslides in critical geological conditions. Construction activities, including opening access roads, establishing and operating camp sites, need etc. are typically more in entirely new road comparing with the same length of road rehabilitation.

Roads sections which are sensitive to erosion are identified by geological formations, climate, topography and soil type. Depending on the above factors erosion sensitivity can be preliminarily classified as highly sensitive, sensitive, slightly sensitive and not sensitive.

*Highly sensitive:* Roads sections crossing humid and temperate climate, highly erodible soils on undulating and rolling terrain composed of unwelded volcanic ashes, humid climate highly dissected topographic conditions composed of alkaline olivine basalts.

*Sensitive:* Humid climate composed of sedimentary formations limestones and sandstones of rivers gorges, temperate climate composed of alkaline olivine basalt.

*Slightly sensitive:* Roads sections traversing semi-arid climate of sedimentary formation of mountainous hilly topography, recent lava of undulating and rolling plains and flat plains.

*Not Sensitive:* Roads sections traversing porous media of alluvial fans (bajades) flood plains and very flat plains of different geological formation.

Erosion sensitive sections of the road sector programme for the rehabilitation and/or upgrading roads trunks and major links are given in table 4.1 and new construction table 4.2.

**Table 4.1 Erosion sensitive section of road sector programme for rehabilitation and upgrading**

N/N	ROAD PROJECT	HIGH EROSION SENSITIVE
1	Addis - Jimma	Gibe river gorges
2	Mojo - Awassa	Ziway - Shashamene (Step faults)
3	Mojo - Awassa	Nazareth - Welenechiti
4	Addis - Woldiya	Debre Sina - Shewa Robit & Kombolcha - Dessie
5	Addis - Dbre Markos	Abbay river gorge
6	Woldiya - Zalambessa	Woldiya - Robit and Alamata - Hiwane
7	Gondor - Mereb river	Dabat - Shire & Tekeze Gorge
8	Ghimbi - Asosa	Transional scarp to the lowlands
9	Metu - Gambella	Transitional scarp to the lowlands of Gambellas
10	Bati - Mille	Transitional scarp of the rift
11	Woreta - Woldiya	Crossing the water shed divide of Danakil and Tekeze (Woldiya - Dilbe)
12	Gonder - Humera	Transitional scarp to the lowlands

**Table 4.2 Proposed major link road projects which have erosion sensitive sections.**

N/N	ROAD PROJECT	HIGH EROSION SENSITIVE
1	Chida - Sodo	Omo River gorge
2	Indassilassie - Humera	Transitional scarp to the lowlands
3	Azezo - Metema	Transitional scarp to the lowlands
4	Dera - Mechara	Transitional scarp and step faults
5	Debrework - Kombolcha	Disserted terrain and Abbay river gorge

### Mitigation of Erosion Risks

Problems associated with critical geological conditions and river bank erosion should be tackled by avoiding the sensitive slopes and river sections, as far as possible. Accordingly, careful siting of road alignments and major structures is the main means to avoid hazards. Structural measures to control unstable slopes or protect river banks are relatively expensive (although

often necessary and/or economically efficient) and should be the solution (only) in the cases where alternative siting is not possible.

Sheet and rill erosion of exposed road slopes (cut and fill slopes) are largely controlled by good engineering practise. Slope protection by bio-engineering techniques should be emphasized as far as possible. Bio-engineering, as well as other slope protection measures are very site specific and can be selected preliminarily in engineering design stage, and finally during the construction.

Efficient drainage is in a key role in erosion control, drainage structures should be provided for every natural drainage, flood paths and frequent cross drains on hilly terrains. The opening of drainages should pass the appropriate return period flood with minimum concentration of flows (minimum scouring).

Extraction of materials from borrow pits, rivers and quarries should be done in a planned manner to avoid or minimize erosion. The extraction of gravel and sand from large rivers could create serious impacts if the hydraulic profile is modified. Gravels and sands shall not be extracted from minor river bed to avoid scouring (and water pollution). After completion of the work restoration of sites shall be carried out by refilling the borrow pits and quarries from cut of top soils, or using the places for water harvesting in geohydrologically favourable conditions.

### **Monitoring**

During construction phase Environmental Inspector, appointed to the project concerned, will be responsible for monitoring that all the erosion control measures specified in the contract documents and/or agreed at the site are properly and timely done.

After construction the maintenance section of ERA will follow-up and accordingly report to the Environmental Impact Branch of ERA about the condition and function of erosion control measures which are on Right-of-Way, or in the vicinity of the road .

## **4.3 Physical Environment: Pollution Hazards**

### **Water Resources and Water Quality**

The main issue is to avoid depletion of local water resources which are used for drinking water, irrigation or fishery activities. All the springs, small streams and wells should be mapped within the influence area of the road project.

Use of local water resources for construction purposes should be well planned and agreed with the local people to avoid conflicts and to ensure sufficient and safe water supply.

Care should be taken not to pollute the rivers and springs with cement slag and spill of oil and fuel by providing diversion and other measure appropriate to each specific site.

Proper measures should also be taken during foundation excavation not to increase the turbidity of the river flow. For the same purpose erosion control structures and drainage should be designed to prevent accelerated sedimentation downstream.

## Air Pollution

A critical issue of air pollution is dust. This is a problem during construction but may be a nuisance and a health risk to local people also during the road operation due to emissions of vehicles in rural centers/towns.

The contractor should be responsible to plan the construction activities in such a way that unnecessary dust (and noise) will be avoided. Paved roads with paved shoulders and protected embankment/ cut slopes will have minimum dust problems during operation.

## 4.4 Natural Environment

### Flora

The highly variable physical environment has created a wide range of ecological types, from arid lowlands in the east to rain forest in the west and high-altitude afro-alpine vegetation in the central highlands. The resulting rich biodiversity is, however, severely threatened by environmental degradation, particularly in the densely populated areas. The forest areas in Ethiopia are delineated on the land use and land cover maps prepared by land use planning department of the Ministry of Agriculture (see Figure 4.3 and 4.4).

There is no detailed up-to-date information on the location and extent of forest resources of Ethiopia, and/or rates at which these resources are being depleted. Calculations made in 1990<sup>2</sup> indicated that with the envisaged trends in population growth, wood fuel consumption, and biomass production, the biomass resources would decrease to about 60% of the 1990 level by 2010, and 30% by 2020. The Plan called especially for the development of line plantations as part of farming systems and watershed management schemes; a well commercially managed program could have reversed the trend. It was considered impractical to put much reliance on dwindling managed natural forest blocks to supply for the needs of the population, especially since changes in the sources of energy and building poles were expected to be slow.

The Ethiopian Forestry Action Plan (EFAP 1994) reported that it has been widely believed that in the early 1950s, some 16% of Ethiopia's land area of about 120 million ha might have been covered by coniferous or broadleaved forests, and that by the early 1980s this had declined to 3.6%, and by 1989 to about 2.7%. It is only the parts of the south and the southwest that many forest blocks remain. The current annual loss of high forest area has been estimated at between 150,000 and 200,000 ha. At this rate, all that would remain of these high forests in 15 years time would be scattered forest remnants in inaccessible areas. The main sources behind deforestation and forest degradation are population growth and economic pressure, increasing demands for crops, pasture and timber.

Ethiopia's forest and woody vegetation are classified (EFAP, 1994) into (i) natural high forest, (ii) woodlands, (iii) bushlands, (iv) plantations, and (v) trees on farms and roadsides.

Natural high forests commonly have a closed stand of trees with a more or less continuous canopy rising from 7 to 30 m, and a sparse ground cover. Ethiopia's remaining natural high forests largely include various types of montane forests concentrated in the sparsely populated southern and western parts of the country. The central and northern parts have little natural high forest, mostly in natural parks and other protection areas. Humid mixed forests occur in

---

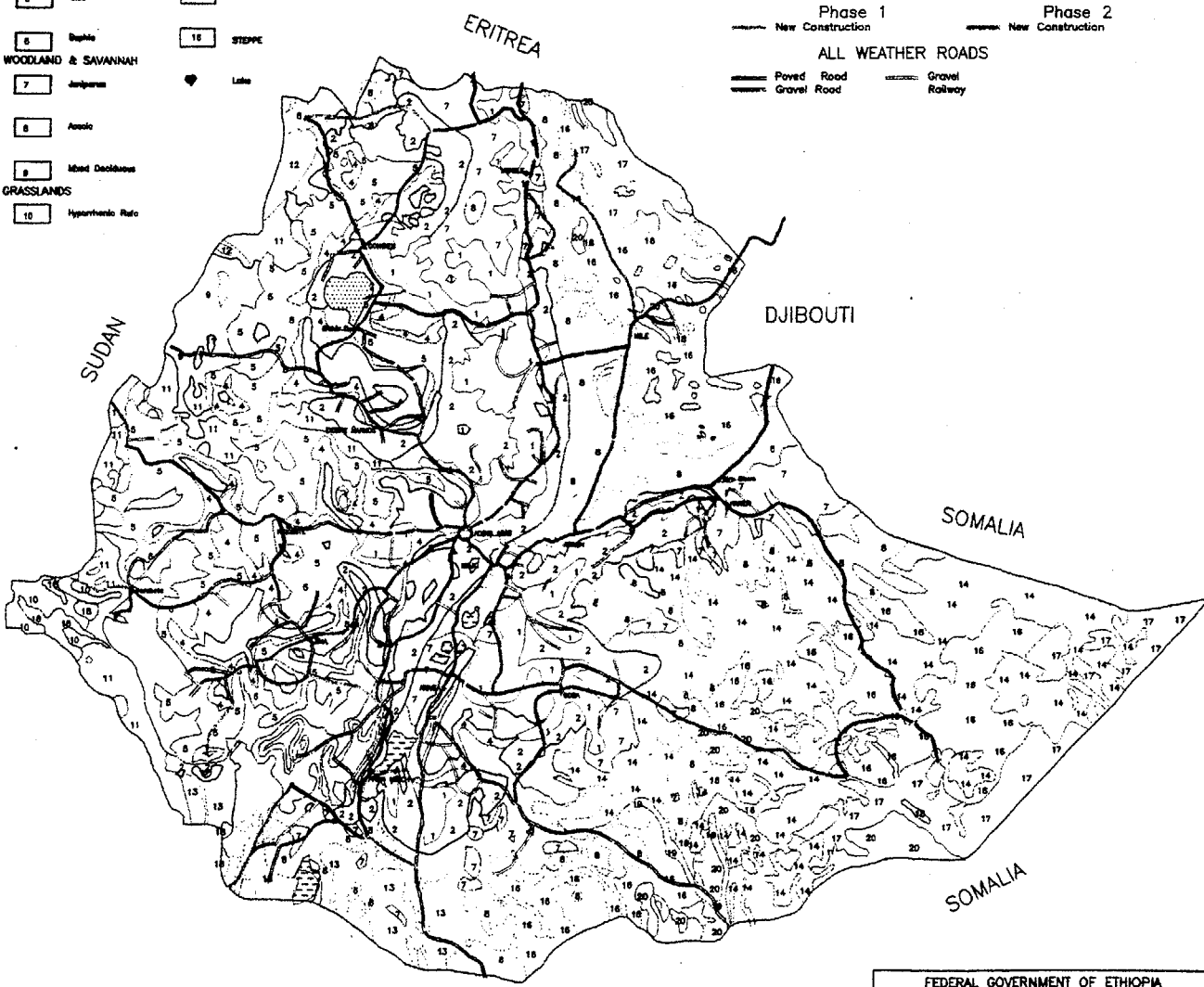
2. Ministry of Agriculture 1990. Ethiopia: Wood Fuel Production Development. Draft Sectoral Plan. Fuelwood Plantation Expansion Division, State Forestry Conservation and Development Department, Natural Resources Conservation and Development Main Department, Addis Ababa. 58 p.



CLIMATIC CLIMAX VEGETATION

- |                                |                    |                          |                          |          |   |
|--------------------------------|--------------------|--------------------------|--------------------------|----------|---|
| <input type="checkbox"/>       | ALPINE & SUBALPINE | <input type="checkbox"/> | 17                       | SEMICERT |   |
| <b>CONIFEROUS FOREST</b>       |                    |                          |                          |          |   |
| <input type="checkbox"/>       | 1                  | Jelapar                  | <input type="checkbox"/> | 11       | Hyperbatic Fibrosus                         |
| <input type="checkbox"/>       | 2                  | Pedacarpus               | <input type="checkbox"/> | 12       | Sorghum Purpuris Caricaum                   |
| <b>BROADLEAF FOREST</b>        |                    |                          |                          |          |   |
| <input type="checkbox"/>       | 3                  | Arundinaria              | <input type="checkbox"/> | 13       | Caninus Ciliaris                            |
| <input type="checkbox"/>       | 4                  | Antigaris                | <input type="checkbox"/> | 14       | Chrysosgen Ancharis<br>Dasyketeleum Schidum |
| <input type="checkbox"/>       | 5                  | Qac                      | <input type="checkbox"/> | 15       | Artisid                                     |
| <input type="checkbox"/>       | 6                  | Dakia                    | <input type="checkbox"/> | 16       | STEPPE                                      |
| <b>WOODLAND &amp; SAVANNAH</b> |                    |                          |                          |          |   |
| <input type="checkbox"/>       | 7                  | Jalparis                 | <input type="checkbox"/> | 18       | Lake  |
| <input type="checkbox"/>       | 8                  | Acacia                   |                          |          |   |
| <input type="checkbox"/>       | 9                  | Mixed Deciduous          |                          |          |   |
| <b>GRASSLANDS</b>              |                    |                          |                          |          |   |
| <input type="checkbox"/>       | 10                 | Hyperbatic Rato          |                          |          |   |

- PROPOSED ROAD UNDER RSDP TRUNK ROAD**
- |         |                             |         |                        |
|---------|-----------------------------|---------|------------------------|
| Phase 1 |                             | Phase 2 |                        |
|         | Asphalt Upgrading Road      |         | Asphalt upgrading Road |
|         | Gravel upgrading Road       |         | Gravel upgrading Road  |
|         | Asphalt Rehabilitation Road |         |                        |
- MAJOR LINK ROAD**
- |         |                        |         |                        |
|---------|------------------------|---------|------------------------|
| Phase 1 |                        | Phase 2 |                        |
|         | Asphalt upgrading Road |         | Gravel upgrading Road  |
|         | Gravel upgrading Road  |         | Asphalt upgrading ROAD |
- NEW CONSTRUCTION MAJOR LINK ROAD**
- |         |                  |         |                  |
|---------|------------------|---------|------------------|
| Phase 1 |                  | Phase 2 |                  |
|         | New Construction |         | New Construction |
- ALL WEATHER ROADS**
- |  |             |  |                |
|--|-------------|--|----------------|
|  | Paved Road  |  | Gravel Road    |
|  | Gravel Road |  | Gravel Railway |



KENYA

FEDERAL GOVERNMENT OF ETHIOPIA ETHIOPIAN ROAD AUTHORITY	
THE ENVIRONMENTAL IMPACT ASSESSMENT OF THE ROAD SECTOR	
PLANCENTER L&L FINLAND	
CLIMATIC CLIMAX VEGETATION & RSDP ROAD MAPD	Figure 4.3
	Date

# LEGEND

## PROPOSED ROAD UNDER RSDP TRUNK ROAD

Phase 1		Phase 2	
—	Asphalt Upgrading Road	—	Asphalt upgrading Road
—	Gravel upgrading Road	—	Gravel upgrading Road
—	Asphalt Rehabilitation Road		

## MAJOR LINK ROAD

Phase 1		Phase 2	
—	Asphalt upgrading Road	—	Gravel upgrading Road
—	Gravel upgrading Road	—	Asphalt upgrading ROAD

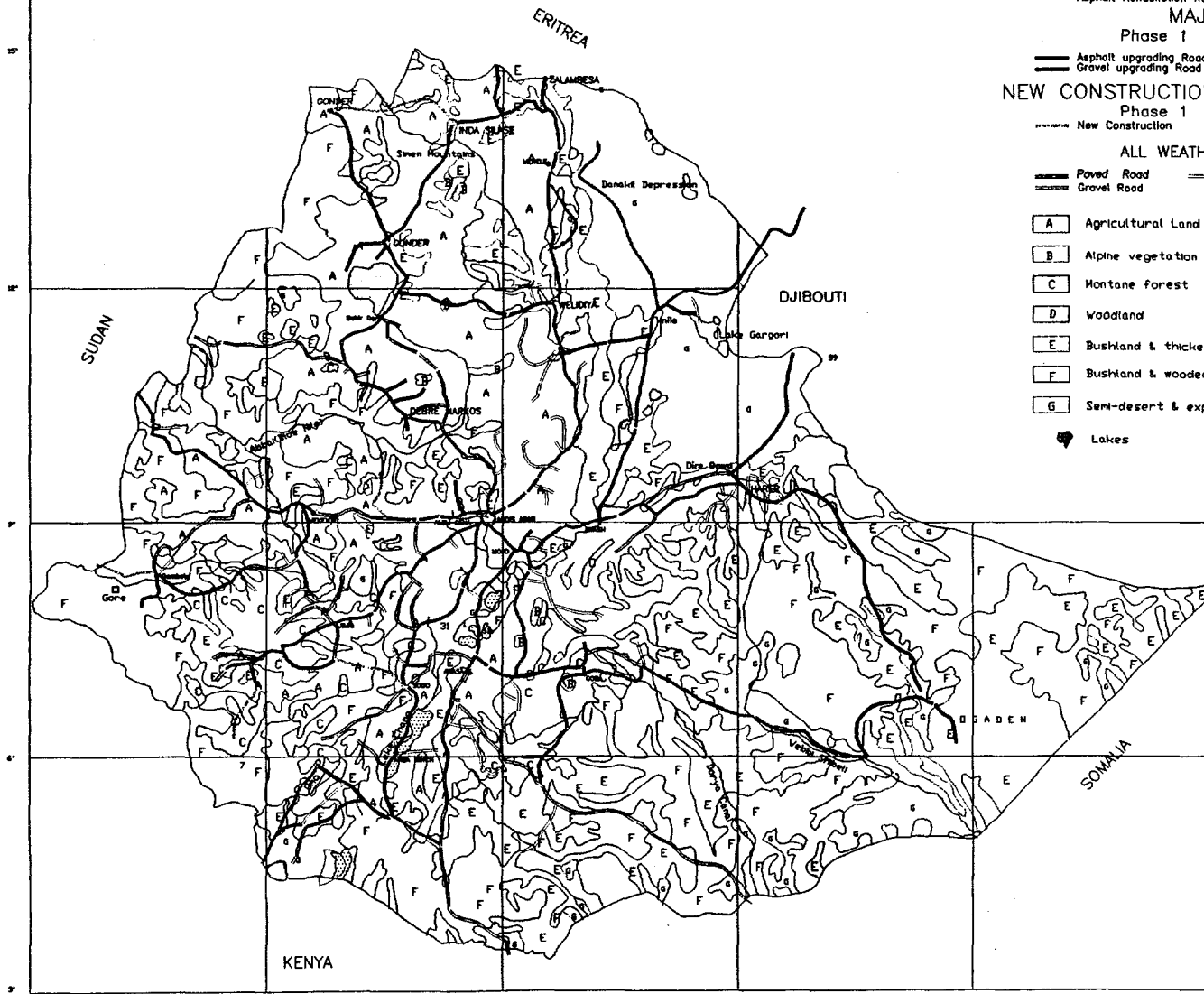
## NEW CONSTRUCTION MAJOR LINK ROAD

Phase 1		Phase 2	
—	New Construction	—	New Construction

## ALL WEATHER ROADS

—	Paved Road	—	Gravel
—	Gravel Road		

[A]	Agricultural Land
[B]	Alpine vegetation (altimontane)
[C]	Montane forest
[D]	Woodland
[E]	Bushland & thicket
[F]	Bushland & wooded grassland
[G]	Semi-desert & exposed rock or sand
◼	Lakes



FEDERAL GOVERNMENT OF ETHIOPIA  
ETHIOPIAN ROAD AUTHORITY

THE ENVIRONMENTAL IMPACT ASSESSMENT  
OF THE ROAD SECTOR

PLANNED LIAISON

LAND USE AND RSDP ROAD MAP

Southern Ethiopia and Hararghe province, with Podocarpus, Croton, Olea, Schefflera, and Hagenia at higher altitudes.

Woodlands and bushlands -- lowland woodland, bushland, shrubland, and wooded grassland -- represent a variety of woody vegetation types. In Ethiopia woodlands and bushlands are largely restricted to the agro-pastoral and pastoral zones. They occupy large areas in the Awash region, East and South Hararghe, the Rift Valley, South Sidamo, Welega, Gonder and the slopes of the Eastern and Central highlands.

Plantations include industrial and pre-urban plantations established and operated by the Government, as well as community woodlots and catchment/protection plantations. The majority of the industrial plantations are found within the boundaries of the National Forest Priority Areas (NFPAs).

Farm forestry integrates tree growing with farming systems.

The government has classified 58 of the most important high forest areas totalling an estimated 2.8 million ha as National Forest Priority Areas.

### **Fauna**

The faunistic diversity of Ethiopia is great. This is mainly due to the variation in climate, topography and vegetation. Figure 4.5 on the following page as well as the Table 1 in the Annex 10 show the faunistic diversity of Ethiopia as assessed by Ethiopian Wildlife Conservation Organization (1990).

The Government of Ethiopia, has established conservation or protected areas in the country. The description and the present categories of conservation or protected areas are limited to:

- National Parks
- Sanctuaries
- Wildlife Reserves, and
- Controlled Hunting Areas

The list of national parks, reserves, controlled hunting areas and wildlife conservation areas of Ethiopia are presented in Figure 4.6 and the Tables 2 and 3 in the Appendix 10.

### **Adverse Impacts**

One of the major unavoidable impact of roads is the effect on the terrestrial vegetation in the vicinity by the virtue of the construction. The impact on natural vegetation would be associated with operating the quarry and borrow areas, and constructing diversion road and access to the quarry sites. Major environmental impact will also results from excessive widths of right of way, which might be required to accommodate oversized equipment. While some flexibility is essential to achieving stability of cuts and fills, exacting principles of design also need to be adhered in order to avoid excessive destruction of vegetation and disturbance of land.

Uncontrolled use of wood for energy and for construction purposes during a road project may lead to significant destruction of forest resources locally.

The construction of some roads will penetrate parts of National Parks or other sensitive areas, and will require land clearing, which will cause an impediment to movement of wildlife and

PROPOSED ROAD UNDER RSDP  
TRUNK ROAD

- |                               |                          |
|-------------------------------|--------------------------|
| Phase 1                       | Phase 2                  |
| — Asphalt Upgrading Road      | — Asphalt upgrading Road |
| — Gravel upgrading Road       | — Gravel upgrading Road  |
| — Asphalt Rehabilitation Road |                          |

MAJOR LINK ROAD

- |                          |                          |
|--------------------------|--------------------------|
| Phase 1                  | Phase 2                  |
| — Asphalt upgrading Road | — Gravel upgrading Road  |
| — Gravel upgrading Road  | — Asphalt upgrading ROAD |

NEW CONSTRUCTION MAJOR LINK ROAD

- |                    |                    |
|--------------------|--------------------|
| Phase 1            | Phase 2            |
| — New Construction | — New Construction |

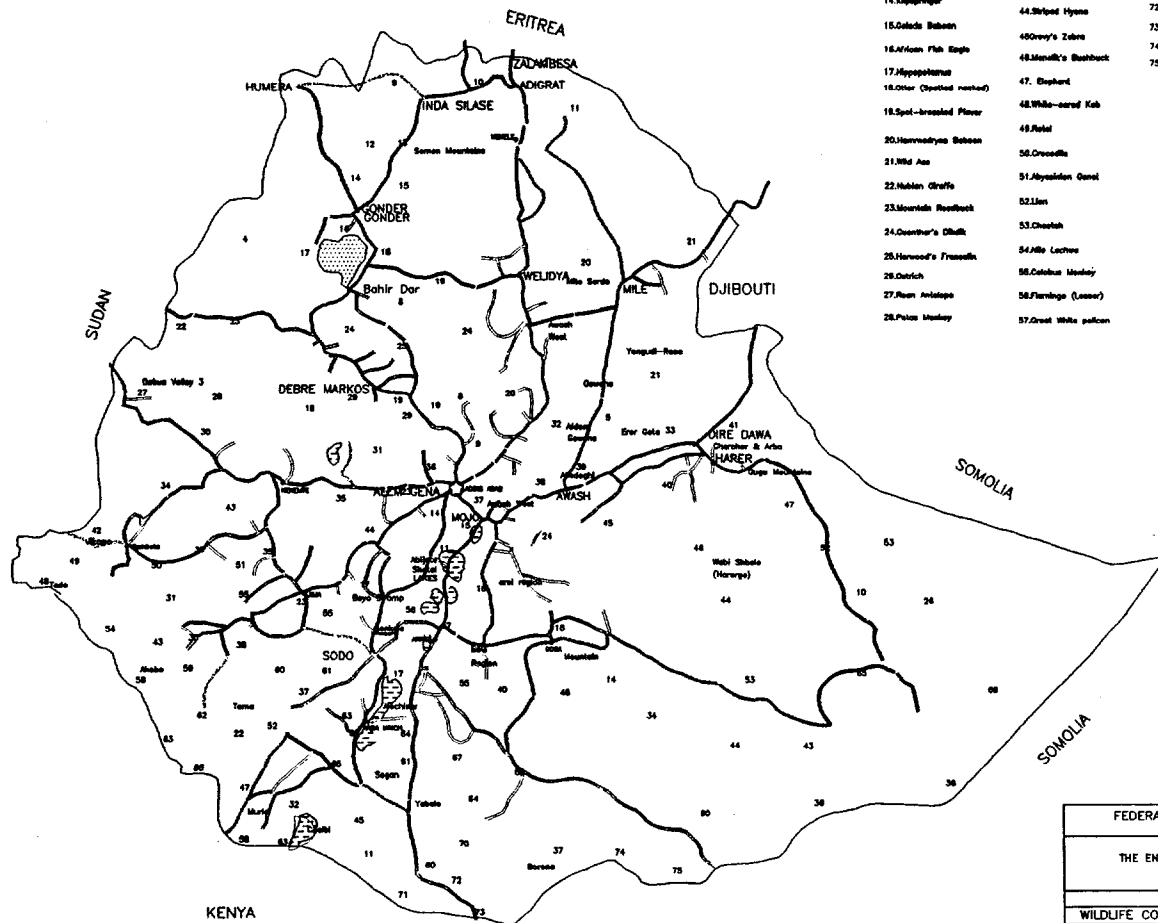
ALL WEATHER ROADS

- |               |           |
|---------------|-----------|
| — Paved Road  | — Gravel  |
| — Gravel Road | — Railway |

● Lake

LEGEND

- |                              |                           |                               |
|------------------------------|---------------------------|-------------------------------|
| 1. Arabian Oryx              | 29. Abyssinian Long-eared | 58. Lateral Hornbill          |
| 2. Duress                    | 30. Black Leopard         | 59. Ostrich                   |
| 3. Greater Kudu              | 31. Great Forest Hog      | 60. Lesser Kudu               |
| 4. Topi Hornbill             | 32. Dwarfed Waterbuck     | 61. Swayne's Hornbill         |
| 5. Spoke's Gazelle           | 33. Dwarfed Gazelle       | 62. Rhinoceros                |
| 6. Green Turtle              | 34. Serval Cat            | 63. Buffalo                   |
| 7. Dwarf Seemingly's Gazelle | 35. Civet                 | 64. Omani's Gazelle           |
| 8. Ruppell's Chat            | 36. Caracal               | 65. Aard Wolf                 |
| 9. Warburg                   | 37. Caracal               | 66. Dand                      |
| 10. Pangolin                 | 38. Scurrying's Gazelle   | 67. Burchell's Zebra          |
| 11. Aardvark                 | 39. Mountain Nyala        | 68. Hunting Dog               |
| 12. White Bear               | 40. Nile Antelope         | 69. Dhole                     |
| 13. Striped Fox              | 41. Topi (Topi)           | 70. Prince Ruppell's Tortoise |
| 14. Kudu                     | 42. Leopard               | 71. White-tailed Sable        |
| 15. Ostrich                  | 43. Serval                | 72. Swayne's Bush-Crow        |
| 16. African Fish Eagle       | 44. Serval                | 73. Red-tailed Grackle        |
| 17. Hippopotamus             | 45. Serval                | 74. Common Waterbuck          |
| 18. Otter (Spotted nosed)    | 46. Masaka's Bushbuck     | 75. Oriole                    |
| 19. Spot-browed Plover       | 47. Elephant              |                               |
| 20. Horned Oryx              | 48. White-eared Kudu      |                               |
| 21. Wild Ass                 | 49. Kudu                  |                               |
| 22. Hartebeest               | 50. Oryx                  |                               |
| 23. Mountain Reedbuck        | 51. Abyssinian Oryx       |                               |
| 24. Oryx's Oryx              | 52. Lion                  |                               |
| 25. Harwood's Fossil         | 53. Cheek                 |                               |
| 26. Oryx                     | 54. Nile Crocodile        |                               |
| 27. Nile Antelope            | 55. Common Mongoose       |                               |
| 28. Plains Mongoose          | 56. Flamingo (Lesser)     |                               |
|                              | 57. Great White pelican   |                               |



FEDERAL GOVERNMENT OF ETHIOPIA  
ETHIOPIAN ROAD AUTHORITY

THE ENVIRONMENTAL IMPACT ASSESSMENT  
OF THE ROAD SECTOR

FLANCENTER LIA. FINLAND

WILDLIFE CONSERVATION AND RSDP ROAD MAP

PROPOSED ROAD UNDER RSDP  
TRUNK ROAD

- |                               |                          |
|-------------------------------|--------------------------|
| Phase 1                       | Phase 2                  |
| — Asphalt Upgrading Road      | — Asphalt upgrading Road |
| — Gravel upgrading Road       | — Gravel upgrading Road  |
| — Asphalt Rehabilitation Road |                          |

MAJOR LINK ROAD

- |                          |                          |
|--------------------------|--------------------------|
| Phase 1                  | Phase 2                  |
| — Asphalt upgrading Road | — Gravel upgrading Road  |
| — Gravel upgrading Road  | — Asphalt upgrading ROAD |

NEW CONSTRUCTION MAJOR LINK ROAD

- |                    |                    |
|--------------------|--------------------|
| Phase 1            | Phase 2            |
| — New Construction | — New Construction |

ALL WEATHER ROADS

- |               |          |
|---------------|----------|
| — Paved Road  | — Gravel |
| — Gravel Road |          |

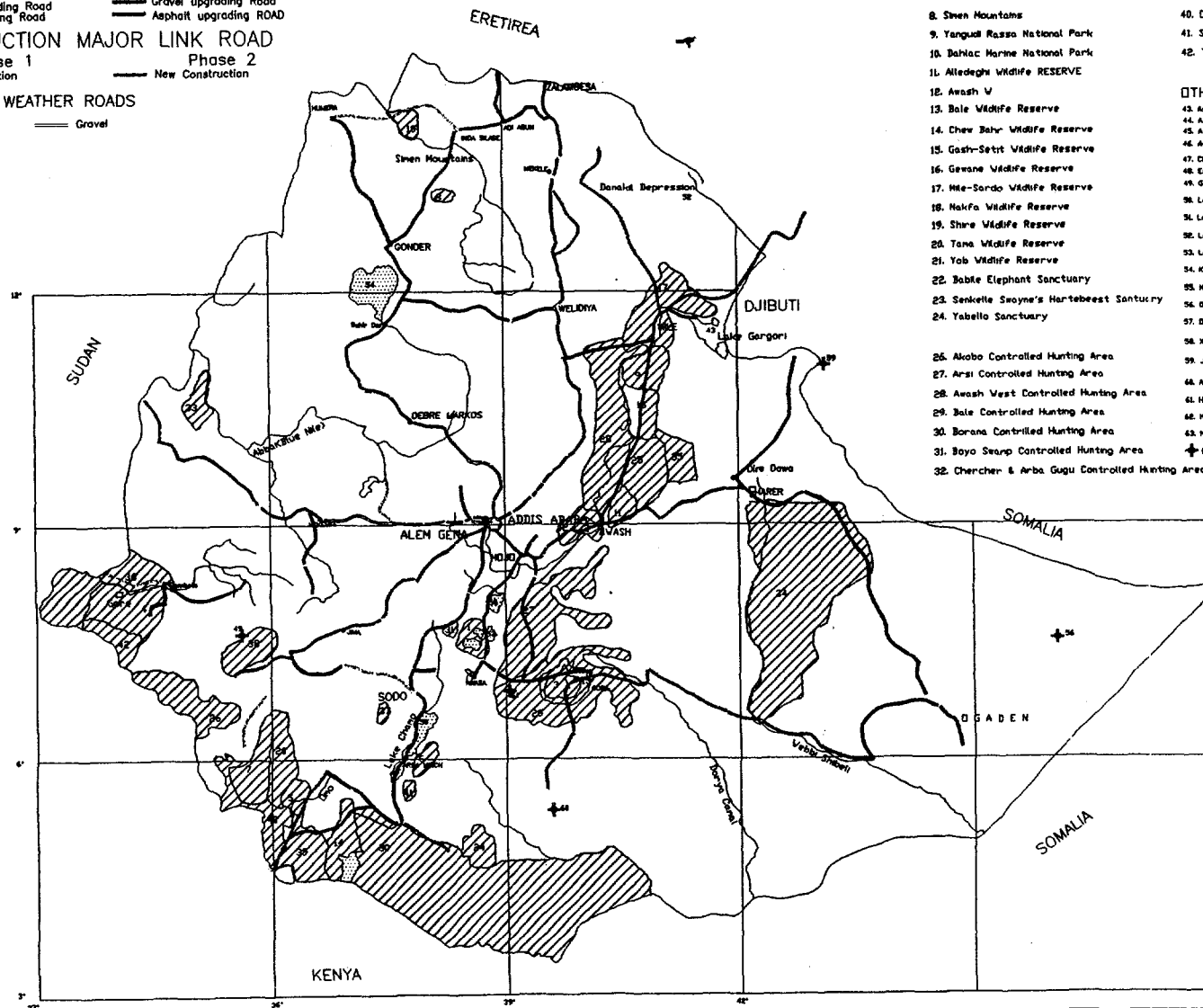
Lakes

PROTECTED AREAS

1. Abjatta-Shalla Lakes National Park
2. Awash National Park
3. Bale Mountains
4. Gambella National Park
5. Mago National Park
6. Nechisar National Park
7. Dho National Park
8. Simen Mountains
9. Yangudi Rassa National Park
10. Bahiac Marine National Park
11. Alledgehi Wildlife RESERVE
12. Awash W
13. Bale Wildlife Reserve
14. Chew Bahr Wildlife Reserve
15. Gash-Setti Wildlife Reserve
16. Gwane Wildlife Reserve
17. Hse-Sordo Wildlife Reserve
18. Nakfa Wildlife Reserve
19. Shire Wildlife Reserve
20. Tana Wildlife Reserve
21. Yob Wildlife Reserve
22. Sabite Elephant Sanctuary
23. Senkelle Swayne's Hartebeest Santuary
24. Yabello Sanctuary
25. Akobo Controlled Hunting Area
27. Arsi Controlled Hunting Area
28. Awash West Controlled Hunting Area
29. Bale Controlled Hunting Area
30. Borana Controlled Hunting Area
31. Bayo Swamp Controlled Hunting Area
32. Chercher & Arba Gugu Controlled Hunting Area
33. Dabus Valley Controlled Hunting Area
34. Easter Hararghe Controlled Hunting Area
35. Erer-Gota Controlled Hunting Area
36. Jkoo Controlled Hunting Area
37. Mize Controlled Hunting Area
38. Hzon-Tsferi Controlled Hunting Area
39. Murle Controlled Hunting Area
40. Dho West Controlled Area
41. Segen Valley Controlled Hunting Area
42. Tedo Controlled Hunting Area

OTHER IMPORTANT AREAS

43. Asata Lakes
44. Asala Lakes
45. Asala Told & Coastal Wetlands
46. Asosa Lakes
47. Drive Lakes
48. Entresoouth
49. Goro & Topi Forests
50. Lake Abaya
51. Lake Abbe
52. Lake Afrera
53. Lake Laagan
54. Kaino Tana
55. Hararghe State Forest
56. Ogden
57. Dho River Delta
58. Yoa Lake
59. Junction of Ethiopea, Somali & Djibuti
60. Arera Forests
61. Harara Forests
62. Harara Swamp
63. Harara Hubarec
- Other Important Areas



FEDERAL GOVERNMENT OF ETHIOPIA ETHIOPIAN ROAD AUTHORITY
THE ENVIRONMENTAL IMPACT ASSESSMENT OF THE ROAD SECTOR
PLANNING UNIT
NATURAL HABITATS AND RSDP ROAD MAP
Figure 4.5 [Date]

destruction of wildlife habitat. As the proposed road project could be new, therefore, the wildlife which presently inhabit the proposed project area may be forced to migrate to other areas during construction and change in the existing species of mammals and birds can result within the park. This temporary displacement may be significant to cause catastrophe. The major potential adverse impacts include extinction of important or indigenous species.

#### **Mitigating measures**

New road alignments through National Parks, Sanctuaries, Wildlife Reserves and Controlled Hunting Areas should be avoided. If not possible, a detailed EIA is always necessary. Staff and experts of the concerned sensitive reserve areas shall be involved in inventories of EA, as well as in further planning of any activities within the area.

The above should be applied also for roads having long sections within important natural or planted forests. Forestry Authorities and local people shall be consulted in that case to minimize forest encroachment and to avoid any conflicts between the project and local communities.

Use of local natural resources for energy, food or construction purposes should be controlled and done only in a planned way. Hunting, fishing and collecting firewood by the project staff or manpower should normally be restricted. If such resources are available the right to harvest (and sell) those should be with the local communities.

#### **4.5 Human and Social Environment**

The major human and social impacts of road construction are those related to social acceptability, resettlement, change of way of life, impacts on indigenous peoples, induced development and conflicts between locals and immigrants. There will be at least temporary losses of agricultural and grazing land (for detours, construction camps, storage sites, asphalt plants etc.). Some houses may have to be removed along the roads. The road construction camps will have both short and long lasting impacts on the local communities. Although the construction camps/sites are planned to be temporary, the experience show that many camps turn out to be permanent settlement places after the construction period is over. The improved roads make it easier to the tourists to reach the cultural and historical monuments and sites near the road, which also may have some adverse impacts.

It is important to identify project-affected persons, properties and economic entities at the earliest stages of road planning, and to make more detailed assessments as the project is more fully defined. Impacts should be categorized in terms of the types of land, persons, and activities affected, and whether the effects are temporary or permanent. Where initial analyses identify possible effects on land use, land surveys and interview surveys are generally required to provide detailed information.

#### **Impact identification and assessment**

In preliminary planning for the road projects, the approximate number of properties, houses, businesses, and roadside activities likely to be affected should be identified for different alternatives under consideration. This first identification indicates the needs for closer investigation of land occupation and resettlement needs.

Further study should identify the types of people, land, and activities which will be affected and the availability of measures to avoid or mitigate these effects. The alternative solutions should be considered in this stage.

A table of project-affected persons should be developed in all cases where a road project involves new lands required for construction of a road. This table can be somewhat approximate in early stages of project planning, but the details should become precise as options are clearly defined and land surveys and final design are completed.

A table should identify (i) the people affected (e.g., owners, renters, employees, squatters etc.), (ii) the type of impact on land (e.g., farm size reduced, houses/shops acquired, access limited) and (iii) the type of impact on people (e.g., reduced livelihood, house lost etc).

Magnitude of impacts requires more detailed analysis. For residences, impact identification requires an inventory of houses affected and the extend of property acquisition from each. (i) Owners, (ii) renters, (iii) squatters are distinct categories of residents and are usually entitled differently to compensation under the law. At the present only an owner of a house are compensated due to the loss of house; the tenants have no compensation right. However, all these people have to find another place to live.

Some special characteristics might affect the compensation and especially resettlement practice and hence the information of those persons who will be affected should also include

- (i) length of residence, since migration is quite a big phenomenon in Ethiopia, and the share of migrants in communities is considerable. In many towns half of population are migrants, although the general migration pattern in the country is rural-rural in absolute numbers.
- (ii) sex of affected persons, and collected information should be also gender sensitive which need sex segregated data. The share of female headed households is especially high in urban Amhara and Tigray regions where 40 and 50 percent of all urban households are female headed. It is also estimated that an average rural household spends approximately 2600 hours per annum on transport to reach market places, service centers, grinding mills, water points etc. Out of these, more than 70 percent of the tasks are undertaken by women.
- (iii) ethnicity and religion, since there are over 80 ethnicities in Ethiopia which fact any resettlement plan must take into consideration.

Also impact identification on business should be prepared. An estimate of temporary financial loss and of temporary relocation costs will be required for those businesses that will be affected. Besides permanent changes of the shops etc. due to the loss of land, also the detours might cause considerable losses for the shops, bars etc. which are not removed but might lose clientele.

The losses of future profits/rents etc. have not been compensated by ERA. However, the alternatives which avoid or mitigate local economic losses should be regarded. Technical and financial assistance to modify and adapt businesses to new circumstances should be considered. When possible, this could be done through different income-generation and/or credit programs.

In addition to the direct social impacts caused by the presence of the construction workers/camps to the local communities, also the possibilities to collect information related to the occupational health and safety of the construction workers should be assessed/approach. The construction workers can, if so wanted, be seen also as one stakeholder party.

*Analysis of the received and collected data/information*

Analysis of the social impacts should be broken down analysing/ describing them separately in (i) design, (ii) construction, and (iii) operation and maintenance phases. The design phase should include the possibilities for different stakeholders to participate in planning and design of the projects. Analysis based on assessment for the positive and negative social and economic impacts to the local people and communities during the construction period should be made, as well as the issues related to the safety and sanitary conditions of the construction workers should be assessed.

The social and economic impacts are different to different road user groups depending if they belong to (i) local road side communities or (ii) to the groups using/creating transitory traffic.

Analysis should include also the duration of the impacts, i.e. are the impacts temporary or permanent and to which user groups they are so.

In addition, at least most indirect impacts should be assessed/known and in case they are adverse mitigation measures should be planned.

**Public consultations**

Consultation and communication with all stakeholders and various interest groups should be an integral part of the processes used for gathering environmental data, understanding likely impacts, determining community and individual preferences, selecting project alternatives, and designing viable and sustainable mitigation and compensation plans.

Lack of attention to communication and consultation processes can ultimately cause delays, increased costs, less than satisfactory compromise solutions, which could have been avoided through consultation.

Persons and institutions and organizations which should be consulted include, but are not limited to :

- \* People who are affected by the project, both those who are potential beneficiaries and/or losers
- \* Officials from relevant ministries and government agencies.
- \* Officials from regional and local administration: relevant bureaus and departments, municipalities and kebeles, and/or peasant associations
- \* Local elders who are familiar with the local societies and their social and economic environment. They would also know the places and sites important to the local people due to the religion or ethnicity.
- \* Women as local users of roads
- \* Research institutions
- \* National parks
- \* Local NGOs: development and environmental NGOs; business communities, private transportation sector

The project level committee set up and coordinated by ERA consists of many of the above mentioned participants. However, its present role is mainly/only focused on compensation issues.

The clear information about the project intentions should be available to the concerned stakeholders before consultations. The consultations should be kept in the places and during the



time which is suitable to interested people. This is extremely important in the communities by the road.

The primary data can be also collected using interview surveys, correspondence with relevant persons and institutions.

#### *Secondary data*

Besides public consultations information can/should be collected from statistical organizations and departments dealing with demographic, cultural, and economic data and trends that are important in evaluating social impacts. Many articles, studies and documents might be useful information sources.

### **Mitigation measures in general**

#### *Avoidance*

Impacts on roadside land users can/ could be avoided by choosing route locations away from built-up areas and by restricting the extent of road works to avoid interference with existing activities.

For the long distance transportation the trunk roads could avoid the habited or town areas, but they are also meant to link rural and town economies along the roads to the development of national economy.

Instead of avoidance, local people want the roads to be built near. In Ethiopia where about 80 percent of population live in places from where it takes at least half a day's walk to the nearest all-weather road, people want the road to come right to their villages. Also the government policy assumes that the rural roads will benefit the villagers and that the roads are prerequisites for increased agricultural production and for overall rural development. Many of these new roads will be local and are anticipated to be built with local people's participation.

The avoidance is not popular among the town people either: detours are not liked even for the construction periods by business community. Towns are dependent on roads.

#### *Mitigation*

Most ERA road projects are improvement projects and follow existing roads. Some agricultural lands might be required and some houses might be demolished due to new alignments and/or due to the widening of the present road.

The loss of land can be minimized for new or old roads by modifying the route or design of a road. This will also minimize the effects on nearby properties and land uses.

Consultation with affected people and other interested parties can mitigate the impacts of land acquisition and resettlement actions by providing clear and timely information, by fully discussing options, preferences, and likely outcomes, and by designing implementation arrangements taking full account of the needs of those affected.

When the avoidance is not possible the main mitigation measures would be compensation and/or resettlement. The principle should be that nobody would be worse off after the project/resettlement than before it.

## Compensation

### *Right of Way and Compensation*

Since the 1951 Law ERA has had total displacement rights for people, houses or any other property in the case of construction or maintenance of roads. The law is still from that year but there have been several proclamations after that stating the same right. According to that law ERA can occupy any site for quarries or camps for road construction and maintenance purposes.

The area reserved or right-of-way for roads is 30 meters wide. In case of the new road or new road alignments any property within this area can be removed/demolished by ERA. After road construction nobody is allowed to build houses or shops within this area. The ERA maintenance section is responsible to see that nobody builds anything within this area.

Compensation is paid for the property lost permanently, and/or for temporary losses as the case might be.

### *Property to be compensated*

The land is not property which can or need to be compensated by cash. All land belongs to the government and it can not be sold or bought. The present tenure system gives people the right to use land but no individual ownership. Lost lands can be compensated only by substituting old lands with new ones or resettling people to new places.

Residential or any other type of buildings are considered as property and are compensated according to the market value, i.e to the construction costs of a new similar house/building. However, a wood and mud house should be compensated according to the costs of a new hollow block house due to the environmental reasons to save tree resources.

The owners of these houses (legally or illegally built) are allowed to remove their property before the construction activities starts. Usually the owners whose property will be removed/demolished receive this information about one or two months before the construction work starts. If the tenants are occupying the house to be demolished, only the owner of the house will be compensated; no cash compensation is paid to the tenants.

Trees, and other permanent crops such as coffee and chat plants etc. with commercial value are considered as property and are compensated according to their market price.

In case of the detours or other temporary occupations of agricultural lands, the growing crops so lost, are compensated according to their market value. In the case where crops are lost for several years due to non-cultivation, the average value of the lost crops is estimated at the project level. The compensation should, however, cover the time needed for the first harvest after construction is over.

The costs created by removing transmission/distribution lines or removing//breaking water pipes, drainage systems, telephone lines etc. are compensated by ERA to the owner of these utilities.

Compensation is paid only for any physical property, no compensation is paid for lost economic activities in case of shops and bars. However, there should be some compensation/assistance to owners to start a new enterprise in a new location. In case tenants live in a house, the owner is not compensated for lost rents.

### *Owner receiving compensation*

Compensation is paid to owner of the property, regardless if the owner is a private person, or private or public entity.

Compensation is paid to the owner of the house not depending if owner lives in a house or not. In a case a kebele owns a house it will receive compensation. Especially in the towns there are many tenants renting their houses either from kebeles or other private households. The tenants have no rights to any type of cash compensation. However, some compensation/assistance should be given to the dislocated tenants to overcome the costs of displacement and start a new life in a new location.

The lost crop is paid to the cultivator who can be a private farmer, a cooperative, a state farm etc.

The trees with commercial value are compensated by their market value to the owners which can be private persons, the Ministry of Agriculture or Municipality/Peasant Association etc.

The costs caused to the public utilities, the concerned authority/entity gets the compensation, in case of electric lines compensation is paid to the Ethiopian Electric Light and Power Corporation (former EELPA), telephone lines to the Ethiopian Telecommunication Corporation, sewage systems to the concerned Municipal Authorities etc.

### *Payment schedule*

The property to be compensated is estimated at the time of the expropriation and payments should be paid in time as not to create extra problems for the displaced/ resettled people. The delays in compensation should be avoided.

### *Compensation manner*

The cash compensation might cause problems to the people who are not used to handle big amounts of money. Money may be spend on consumption, thus making people vulnerable to landlessness or homelessness.

Compensation money could be paid to the bank account from which the funds are released when the resettler has received a new home, business or land. Some money can be paid in cash to the resettler so that he/she can take care of extraordinary domestic needs.

In many cases it is preferable to restore or replace any asset taken, rather than provide financial compensation. Productive economic assets represent the owner's livelihoods, and they must be replaced in the new site before the relocation occurs.

### *ERA Compensation Committee*

When the road construction works are decided to start in a certain area, ERA sets a temporary committee at the project level. This committee is established mainly for the compensation purposes. There is no law that require to set any committee, but this is a permanent practice. The members of the Committee get no money compensation for their work.

Committee includes representatives from

- ERA as a coordinator
- Woreda administration to represent the concerned region
- Bureau of Agriculture to estimate value of lost crops and/or trees
- Bureau of Urban Development & Public Works in case of the concerned Municipality
- Kebele/ Peasant Association/ local elders representing local community

The people affected by the road construction do not belong to the committee, but are informed and consulted about the compensation. The consent of all stakeholders must be received. If the consent does not come or the owner is not happy with compensation, the property will be removed anyway and compensation decided by the committee is paid by ERA.

In the public consultations that were held in different parts of the country for the EIA of the five roads, participants wanted to see a committee to be established to handle the cases where the loss of farmland or any other property belonging to the individuals or the community happens due to the road construction. ERA compensation committee fulfill this requirement. However, the committee appointed should not be "a group of unprepared appointed by the unwilling to do the unnecessary".

The committee is set mainly for compensation purposes, although also resettlement possibilities are discussed by members. The committee should, however, have a clear responsibility to see that resettlement issues are solved satisfactorily.

The most important thing is to implement the compensation and displacement and resettlement issues with fairness and with transparency to prevent negative issues among the locals. There have been problems in the past, when compensation/resettlement were not implemented as promised at the beginning and the social issues have been relegated to the side and more importance was given to the technical than social issues.

### *Monitoring*

During design/planning phase ERA's Environmental Management Branch is responsible to look after that the public consultations are held as agreed in tenders.

After the project the ERA Environmental Management Branch is responsible to monitor that the compensation (and resettlement) has been implemented as agreed by ERA compensation committee.

Evaluation studies by ERA should be executed due to the future road activities.

### **Resettlement**

The specifications for resettlement in road projects are guided by the basic notion that the conditions of life, including income, must be restored to at least those levels that existed before the project.

The people who are displaced due to the new roads or new alignments of old roads outside the reserved area, as well as those residing illegally inside it, must find a new place to live.

Although local communities are commonly kept responsible to resettle people, there are no legal regulations requiring them to do so. In practice the local communities resettle people and/or appoint new agricultural lands to the farmers who have lost their lands due to the road construction.

This 'responsibility' is based on the long historical practice on the common idea of justice for an individual right to use agricultural land. In the Abessinya proper (present Amhara and Tigray regions) a person had a right to use land under the *rest/resti* system according to which the agricultural lands were divided at the certain intervals among the families having this (*rest/resti*) right.

This system was based on the ownership of a kinship group, not an individual ownership. The community had the responsibility to redistribute agricultural lands among the families already cultivating land but also to the new families formed by marriage after last redistribution. Redistributions usually happened about every tenth year.

In the southern part of the present Ethiopia *rest* system never existed. However, land was not 'owned' by individuals in the south either. After these lands were annexed to the present Ethiopia, many big plantations were established in this area, and no communal land distributions existed in this part of the country. Under this system the peasants had more permanent tenure for the land they cultivated. Although after the monarchic period part of the lands were distributed among the peasants no communal redistributions happen in this area.

The *rest/resti* system in itself has presently no legality in the country and the people who have the tenure rights have expanded over the previous *rest/resti* families also in the north. However, the last redistribution of lands was finalized in Amhara Region last year. If this system will get (regional) legality, the people who should be resettled may have to wait resettlement to the next redistribution, maybe up to nine years.

When the number of displaced people is small and mainly happen in urban areas, the land allocation for residential buildings in urban areas is still relatively easy. Also the kebeles own houses which are rented to the households, in some towns to a half of all households.

Resettlement with adequate farmlands is not easy in most rural communities due to the scarcity of agricultural land. Resettlement is still felt to be the responsibility of the community represented by kebele administration or peasant association. ERA compensation committee with the woreda/kebele administration are also negotiating in order to find a satisfactory solution to resettle displaced people. However, no evaluations have been done about compensations or resettlements after consent of the committee and the real implementation practice is not known.

In most areas the fields per household are already now small and scattered. The loss of any agricultural lands for road construction is badly felt in any community. In the national level there has not been any radical changes in holding sizes per family. In 1990/91 54 percent of households had 21 percent of all crop area with the holdings less than one hectare (average hold 0.60 ha) and four years later 61 percent of households had holdings less than one hectare (average 0.7 ha). 29 percent of agricultural households have less than half a hectare of crop land.

#### *Mitigation measures for resettlement*

ERA should have the responsibility to see that the compensation committee provide new residence sites to displaced people.

In case of displacement of people a careful attention should be focused on vulnerable and marginal groups/individuals in a community. Such groups include women, especially female headed households, tenants and migrants (both of which are also often women), and in general ethnic and religious minorities.

When resettlement is not possible within a community, the new lands from other less densely populated/cultivated areas could be used for resettling displaced people/families. Ethiopia has considerable unexploited fertile land, which is outside the present densely populated areas.

This solution, however, in the case of involuntary resettlement would need the assistance from the state. When the number of people needing resettlement is big enough, in cases such as construction of dams or airports etc. the state can require (or even execute) a resettlement plan which is financed by the state. After all also the constitution mention the 'adequate assistance' in case of resettlement. In case of ERA constructions the state would be the federal state while in the regional road projects, the assistance would come from the regional states.

### *Issues*

In many rural places the scarcity of agricultural land may, however, lead soon to the situation where all people losing farmland will not receive new agricultural land. The big issue in the future will be the mode of resettlement and especially the compensation of the lost agricultural lands.

Already now it seems that different alternative practices are born. For example, the lands needed by EELPA (which also has the same right as ERA to occupy any land) for the Alamata Substation the farmers were compensated for the permanent loss of land in a form of loss of crop. Those who lost more than one hectare were compensated by the average value of the ten years' crop. The minimum compensation was estimated from three years' crop and the rest between these two extremes. The similar experience comes from the construction of Mekele International Airport.

However, farmers who get cash compensation lose also their occupation with lost agricultural lands. If the resettlement to the agricultural lands is impossible, there should be training and/or other employment possibilities to the displaced people. In some cases displaced people have been employed by the projects to construction work.

There should be a clear national policy on this matter to avoid the situations to be biased from case to case. So far there is no law or regulations about resettlement or compensation of the lost agricultural lands. In the national policy also the local circumstances including physical, social and economic environment must be taken into consideration. Also the question about who are responsible to resettle displaced people is not settled by law. The constitution, however, states that the relocation/resettlement could be provided with "adequate state assistance".

### *Monitoring*

ERA is responsible to monitor and evaluate that resettlement and other arrangements have been arranged as agreed by the committee.

### **Induced development**

Construction camps are one of the characteristic features of any road construction project. Once established, the camps will have several impacts on the surrounding environment. Most impacts are temporary but some are long lasting. ERA camps are built for temporary use, but turn out quite often to be permanently settled, and many previous camps have with time developed into real towns. (The similar development can be found with the previous checking points or *kellas*.)

Earlier the camps were simply called 'ERA camps', most construction work done particularly for the last two decades by ERA. According to the present FDRE's policy, the construction

work is mainly done by private contractors and is open also to foreign tenders. However, no big changes are to be expected in the camp practice; new construction camps follow more or less the previous ERA camp models and practices. Changes may be expected in the (decreased) number of workers residing in the camps.

There are normally 150-250 people residing in the main camp. All of them are professional and skilled workers and move from outside to the camp. The personnel include technical as well as clerical staff. The camps themselves turn out to be like small towns which are headed by a Camp Administrator.

The camps are situated usually outside the towns and often (sometimes kilometers) away from the existing roads. Although ERA has the right to occupy any site for road construction, sites are discussed and agreed together with the local administration.

For the contractor it is more economical to lodge all the workers in one place than have dispersed lodging in the surrounding area. The fact that all professional workers live in the camp makes it also easy to transport them to the construction sites in time and back to the camp. The workers usually stay in the camp one month and every fourth week-end they are taken to the town for *asbesa*/shopping week-end. The local economies benefit from these visits, but social and personal conflicts are also common.

Because of the increased demand on goods and services many people settle down near the camp to do their business. Many of them are without any farmlands and some of them stay even after the camp is demobilized. Many temporary daily labour workers, which consists of 300-400 persons, reside also near the camp.

Although the camp administration does not allow temporary huts and houses to come too close to the camp to avoid looting or other misbehavior, drinking houses and small markets sprout up selling whatever is wanted by the construction workers.

Most food such as meat, grain, vegetables, etc. is bought from local markets to the camp kitchen. Sometimes bigger quantities of items either not locally available or due to the increased local prices, are bought and transported with trucks from the nearby bigger towns. Fire wood is sometimes bought from the construction site if the site is situated in bushy land or it is bought from local markets.

The contractor is responsible to see that the living conditions for the camp residents are kept satisfactory. "Labour Proclamation No. 42/1993" covers the conditions of work including aspects such as hours of work, wage, leave, payment due to dismissal, workers health and safety, compensation to victims of employment injury, dismissal because of redundancy, grievance procedures and any other similar matters.

### *Impacts*

Temporary inflation of prices benefit business people while those local people, and especially poorer section of the community, who are dependant on the same purchases will suffer from increased prices. Although the impacts will be felt only during the construction period the increased demand of goods and services and higher prices will affect some individuals and families to migrate and settle down near the camp sites for their business. Most of these people are landless and continue to stay after the camp has been demobilized.

People who are moving near the camp to do any business may rent land from the local kebeles or PAs and build their own houses. Some of them will settle down illegally without any

registration by the local administration. 300-400 employment possibilities opens to the local people. Also women are hired to the construction work. The Ministry of Labour and Social Affairs is empowered to ensure that local labour is hired in accordance with the law.

The camps have also impacts on the physical environment. The increased need for fire wood and charcoal means that more trees are cut down to be sold and even more wood is wasted to produce charcoal with inefficient local methods. The supply areas might be considerable because of the absence of near forest/tree resources.

The people who settle down are also putting some pressure to the local public services. The drinking water situation might be difficult in some places, and the boreholes are needed to construction camps. The location of boreholes should be such that they can later benefit the local people.

Although the camps have their own health units for minor health hazards, the more serious cases or cases not belonging to the camp sanitarians, the workers and migrants put also pressure to the local health services.

These impacts are directly felt only so long as the camp exist.

Occasional and personal conflicts happen due to many reasons, especially during shopping-week-ends, often due to heavy drinking. Also more cash available among the migrant workers might cause personal conflicts over available resources between locals and migrants.

The families are not allowed to stay in the construction camps and the relations between construction workers and local women are common during the construction period. Due to the dislike about condoms among Ethiopian men the occurrence of venereal diseases increases also among the local population. Many temporary relations result in pregnancies and 'milk payment' court cases increase.

#### *Mitigation plan for induced development*

ERA has the responsibility to see that:

- (i) To induce planned development the sites should be selected in a way which takes into consideration the available natural resources (such as availability of water, fuel etc.) for potential permanent settlement in the future. The fact that the contractor will choose the construction camps on technical bases locating camps at about 80-100 kilometers' interval should give a few kilometers' flexibility in selection of the sites. The preconditions to chose the location of the camp should be the same as for any planned permanent residence place. Enough water for present and future use, natural resources needed for the permanent settlement and their use should be planned and controlled.
- (ii) In vulnerable areas there should be a requirement in tender to plant trees to substitute the abruptly increased demand on local tree resources due to the road construction/camps.
- (iii) ERA maintenance section has to see/inform people that no houses are allowed to be build within the right-of-way.

Kebeles/PAs should see that:

- (i) Houses which are built 'temporarily' due to the camps should be registered/have the building permissions by the kebeles/PAs in order to avoid illegal permanent settlements. By registration also rents to private land and house owners would stay at more normal level.



The Camp Administrator should see, that:

- (i) the 'shopping week ends' should be divided among the construction workers as to avoid all of them to appear to one town at the same time.
- (ii) The health education about venereal diseases (also AIDS is increasing rapidly in Ethiopia) should be compulsory to the construction camp workers, and arranged according to possibilities to local people. Benefits of condoms should be introduced and to be available.

This health education could be arranged in cooperation with the Ministry of Health and/or bought from outside organizations such as local NGOs or INGOs such as Red Cross Society or CARE.

## **Environmental Health**

### *Hazardous materials*

Roads and road constructions have also impacts on people's health. The impacts and their duration are different during the construction and exploiting period. Health hazards may be caused by many actors causing air and/or water pollution.

During the construction period the hazardous construction materials may have negative impacts to the local environment. Various chemicals used in asphalt plants, lubricant oils or fuels for vehicles and other equipments and their storage or disposal methods/systems may cause both short term and long term adverse impacts on water systems and soil.

Road transportation of industrial chemicals and other hazardous materials is always risky to environment. The adverse effects associated with chemicals are not particularly dependent on the numbers of chemicals but rather on the concentrations of individual chemicals. For example, poisoning epidemics resulting from exposure to a specific chemical are possible if accidents happen by the drinking water sources or on the bridges and hazardous materials are leaking to soil or water or released to air.

### *Air pollution and noise related health hazards*

Dust is causing direct and indirect health problems to people who are either permanently living by gravel roads or using them as pedestrians. Dust is also one of the biggest complaints by the local people. Dust is felt to be bad to the health and also causing accidents because it is blocking the visibility for both drivers and pedestrians. Dust and sand is also a common reason for eye damage and indirectly contributes to the occurrence of trachoma which is the reason for half of the blindness in Ethiopia.

The respiratory diseases are common in the country caused by several factors, and harmful emissions/gases created by road traffic have additional negative impacts on people's health especially in urban areas/rural centers.

The noise will be a nuisance to local people during the construction period. However, the construction workers will suffer from continuous noise.

The pavement of the roads has direct positive impacts on people's health and decreasing risks for accidents. However, most roads will stay without pavement and possibilities to use water to mitigate the dust problem should be encouraged.

### *Water related health hazards*

The previous road construction work have left many used quarry and borrow sites to totally untreated condition. Often these sites are filled by water causing different environmental health problems to the local settlements. Also the bad drainage systems, especially when they cause flooding, but also the road sides which are used/constructed to act as drains for rainwater and at the same time are used by the pedestrians are adding health risks to the local people.

The drainage systems and possible floods and/or old water-filled quarry sites may cause *water contact (water-based) diseases* which are caused by infecting agents that for an essential part of their life-cycle develop in specific water animals, mainly snails and crustaceans. The diseases are transmitted by skin contact with pathogen or toxic-infested water. The most important of these diseases is schistosomiasis (bilharzia).

Due to the same reason also the occurrence of *water vector habitat diseases*, especially malaria but also sleeping sickness, has increased. The transition of these diseases depends on the occurrence of their animal vectors (mosquitoes, snails and flies) which live all or part of their lives in water habitat or near them. Especially malaria expands also to the higher altitudes year by year. Also tsetse flies transmitting sleeping sickness (African Trypanosomiasis) are active near water bodies mainly in the southern parts of the country.

Also traffic accidents or leakages with hazardous materials/chemicals in the construction work or their storage may cause local water pollution which may cause health hazards for people. These *waterborne-chemical diseases* occur due to inanimate toxic substances suspended or dissolved in water. If the toxic chemicals are high in concentration, diseases may be manifested in acute form. However, it is much more common, that the toxic substance is in such low concentrations that it only has a cumulative effect leading to chronic disease.

Also poor sanitation conditions in the construction camps may cause drinking water pollution and hence create health problems. The most common syndrome of *waterborne-microbiological diseases* is diarrhea which can be caused by several pathogens.

Insufficient water availability for personal hygiene in the camps may create the conditions for *water-washed diseases* which are mainly fecal-oral transmission diseases, and various skin and eye infections.

### *Sexually transmitted diseases (STD)*

Sexually transmitted diseases form a general problem when people are on the move and their occurrences are bigger by the roads. Also AIDS is increasing in the country. The construction camp workers as well as the local people will affect and be affected by sexually transmitted diseases.

### *Mitigation measures for environmental health problems*

- (i) The dust problem will be present during the construction period and possibilities to use water to mitigate the dust problem should be encouraged.
- (ii) Noise of the construction machinery/equipment should be brought to the level as not to risk the construction workers. It should be also restricted to the certain hours of the day. During the biggest religious days and daily times for prayers the noise should be avoided.

PROPOSED ROAD UNDER RSDP  
TRUNK ROAD

- |                             |                        |
|-----------------------------|------------------------|
| Phase 1                     | Phase 2                |
| Asphalt Upgrading Road      | Asphalt upgrading Road |
| Gravel upgrading Road       | Gravel upgrading Road  |
| Asphalt Rehabilitation Road |                        |

MAJOR LINK ROAD

- |                        |                        |
|------------------------|------------------------|
| Phase 1                | Phase 2                |
| Asphalt upgrading Road | Gravel upgrading Road  |
| Gravel upgrading Road  | Asphalt upgrading ROAD |

NEW CONSTRUCTION MAJOR LINK ROAD

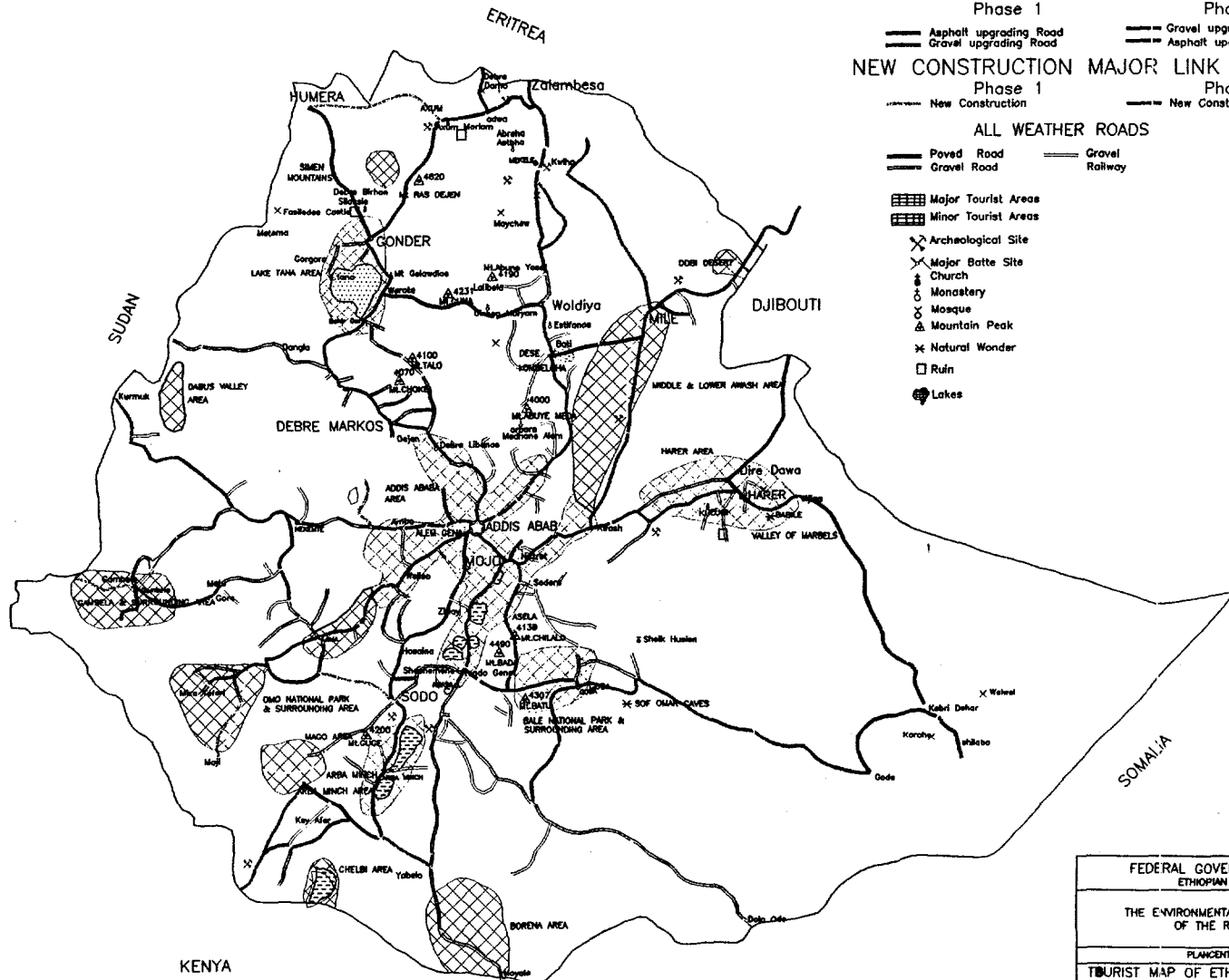
- |                  |                  |
|------------------|------------------|
| Phase 1          | Phase 2          |
| New Construction | New Construction |

ALL WEATHER ROADS

- |             |         |
|-------------|---------|
| Paved Road  | Gravel  |
| Gravel Road | Railway |

- Major Tourist Areas
- Minor Tourist Areas

- Archaeological Site
- Major Bette Site
- Church
- Monastery
- Mosque
- Mountain Peak
- Natural Wonder
- Ruin
- Lakes



FEDERAL GOVERNMENT OF ETHIOPIA ETHIOPIAN ROAD AUTHORITY
THE ENVIRONMENTAL IMPACT ASSESSMENT OF THE ROAD SECTOR
PLANCENTER Ltd. FINLAND
TURIST MAP OF ETHIOPIA AND RSDP ROAD MAP
Figure 4.7
Date

- (iii) The conditions of the vehicles should be inspected and controlled to avoid any excessive harmful releases. However, this task belongs to other authorities than ERA which, nevertheless, could see that the vehicles/equipments used for road construction are in such a condition as to minimize the harmful gas/emission releases. The proper location of bus stops and other parking places in rural centers can minimize adverse impacts caused by harmful emissions and particulars.
- (iv) After the construction period used quarry and borrow sites must be rehabilitated to environmentally sound condition after their use. To bring them back to the condition they were before the present use may not always be enough, because many of the present/future sites have never been rehabilitated after their previous exploitation. In some places local people want these sites to be used for water harvesting. Even in these cases there must be environmentally sound solutions for their new use.
- (v) The storage of the hazardous materials by the construction camps and their use in construction (vehicles, asphalt plants etc.) must be such as not to let chemicals to leak to the soil or water system. After the use of these materials their disposal system must be proper as not to harm environment.

ERA should inspect and monitor at the project level the overflow of chemicals, including their use, disposal, waste releases, dumping grounds, contamination of ground water and chemical catastrophes.

- (vi) Since also the construction camps may cause environmental health problems which are especially related to hygiene and sanitation conditions, the contractor is responsible to see that the health and sanitation conditions in the camps are satisfactory. Especially sufficient amount of water and safe latrines must be available for the personal hygiene of the construction workers.
- (vii) However, it is important to remember that after all the success of health and sanitation programmes depends mainly on how aware people are of the link between sanitation and health.

Compulsory health education must be introduced to the construction workers. Especially this education must focus on venereal diseases and their avoidance and treatment. The cooperation with the Ministry of Health should be looked after. The implementation of the education can be done by relevant local NGOs or INGOs such as Red Cross and Care.

The availability of condoms must be secured.

### **Cultural, Historical and Archeological Monuments and Sites**

Ethiopia is full of valuable archeological and historical sites, many of them still unearthed and undiscovered, as well as important socio-cultural monuments and places (see Figure 4.7). Nationally (and internationally) important and famous monuments/sites are known and taken into consideration when roads are designed and constructed.

However, there are many socio-culturally important places to the locals such as graves and funeral places and/or holy trees and springs which must be taken into consideration when new roads, detours, quarry and other construction sites are designed.

*Mitigation measures to avoid harm for cultural and historical monuments/sites*

For the known monuments and sites the Ministry/Bureau of Information and Culture must be consulted. Public consultations with local administration and local elders must be held to learn about these places.

With better roads also the tourism is anticipated to increase. Parking and rest places and road junctions should be designed so as to maximize road safety.

## **5 ENVIRONMENTAL MONITORING**

Monitoring issues are discussed more detailed in Chapter 4 and in the executive summary under each impact separately. This chapter gives an overview about responsibilities and context/modes of monitoring.

### **5.1 Responsibilities for Monitoring**

ERA shall be responsible in monitoring the environmental impacts of it's own activities. Main responsibility lies on the Environmental Management Branch, which receives the information from the District organizations. The district organizations should report annually to the Branch. The monitoring information is important for future prediction of the impacts of different activities. The Environmental Management Branch shall coordinate the road construction related monitoring activities of other sector agencies, as well.

The Environmental Management Branch will also give advisory services for/after environmental accidents. After oil and chemical accidents, the monitoring of near by water sources and soil contamination shall take place and the people shall be warned about the possible chemical risks.

A person in charge of environmental issues shall be nominated to each District Office of ERA.

### **5.2 Monitoring in Individual Road Projects**

The need for monitoring - whether one time or continuous action, whether needed immediately or after few years - shall be determined for each activity/project separately during the EA process. For example monitoring of erosion has to be continuous whereas impacts of an alignment or detour can be considered one time impacts to the settlements and activities.

It would be good to monitor the changes (population growth, migration, access to development programs etc.) in the communities, for which a new connection to the "outside world" is provided. This kind of monitoring could be done periodically, every third year or so.

The issues to be monitored shall include:

- erosion
- level and quality of ground and surface water
- changes in vegetation; growth of planted trees and other plants
- changes in numbers and routes of wild animals
- cultural and historical monuments and sites
- resettlement, migration
- social structural changes
- growth of tourism

Monitoring of air pollution and noise levels should also be considered, since they can be hazardous for health.

List of Team Members

---

**LIST OF TEAM MEMBERS**

**Foreign Experts**

Mr. Hannu Karttunen	Team Leader/Road Engineering (2 months in Ethiopia)
Ms. Ulla Mustanoja	Sociological Aspects (3 months in Ethiopia)
Mr. Reima Petäjajarvi	Road Sector Environmental Impact Assessment (at the beginning)
Ms. Auli Keinänen	Coordinator/EIA (1 month in Ethiopia - at the end)

**Ethiopian Experts**

Mr. Engida Zemedagegnehu	Hydrogeology/Soil Science/Road Engineering
Dr. Dejene Woldemariam	Ecology/Natural Resources Management
Mr. Atnafe Beyene	Sociology
Mr. Imeru Tamrat Yigezu	Institutional, Legal, Policy and Capacity Building Issues
Mr. Mengistu Haile	Project Coordination and Local Liaison/Road Engineering

**Back-up Home Office Advisers**

Mr. Kari Leminen	Road EIA Specialist
Dr. Kari Mustanoja	Institutional and Capacity Building Specialist

References/Baseline Documents

---

## References/Baseline Documents

### Relevant Legislative and Policy Papers and Guidelines of the Government of Ethiopia:

Proclamation No. 1/1995 Constitution of FDRE

Proclamation No. 63/1993 Ethiopian Roads Authority Re-establishment

The National Conservation Strategy 1994, Vol. I, II, III and IV

Vol II	Federal Policy on Natural Resources and the Environment
Vol III	Institutional Framework and Operational Arrangements for the Federal Policy on Natural Resources and the Environment
Vol IV	Action Plan for the Federal Policy on Natural Resources and the Environment

Proclamation No. 9/1995 Environmental Protection Authority Establishment

Proclamation No. 4/ 1995 - Definition of the Powers and Duties of the Executive Organs of the FDRE Proclamation

Proclamation No. 94/1994 Forest Conservation and Development Conservation (MOA to be requested)

Proclamation No. 122/1995 Ethiopian Roads Authority Amendments

Ethiopian Roads Authority (ERA) 1995: The Profile of Management and Financing of Roads in Ethiopia November 1995.

Ethiopian Roads Authority, ERA 1996: Road Sector Development Program, Second Draft, Final Report, January 1996

Environmental Protection Authority 1996: Environmental Policy of the Federal Democratic Republic of Ethiopia. EPA in collaboration with the Ministry of Economic Development and Cooperation

FDRE, Environmental Impact Assessment, Council of Ministers Regulations (draft 1997)

Ethiopian Roads Authority, ERA 1997: Reform Study Report, May 1997

Environmental Protection Authority, EPA 1997: Environmental Impact Considerations for Transport Sector Projects (draft)

Environmental Protection Authority, EPA 1997: Procedural Guidelines for Environmental Impact Assessment (draft)



References/Baseline Documents

---

**Documents regarding the Five Roads:**

The Transport Construction Design Enterprise (TCDE) 1994-1995: Pavement condition surveying and designs for the following roads:

- a) Kulubi - Mieso, Eng. Report (1994)
- b) Alemgena - Hossana - Sodo Eng. Report, Volume I & II (1995)
- c) Awash - Mille Eng. Report , Volume I (1994)

TecnEcon 1997: Consulting Services for the Five Roads Feasibility Study, Draft Final Report Volume I, II and III, May 1997. Ethiopian Roads Authority/International Development Association.

Plancenter 1997: Inception Reports for the Environmental Analysis of the Road Sector and the Five Roads selected for Upgrading/Rehabilitation (2 separate reports, June 1997). Ethiopian Roads Authority/International Development Association.

**Guidelines, directives and other relevant documents of the World Bank**

The World Bank 1989: Operational Directive 4.00, Annex A: Environmental Assessment

The World Bank 1990: Operational Directive 4.30 on Involuntary Resettlement

The World Bank 1991: Environmental Assessment Source Book

- Volume I Policies, Procedures and Cross Sectoral Issues
- Volume II Sectoral Guidelines
- Volume III Guidelines for Environmental Assessment of Energy and Industry Projects

The World Bank 1991: Operational Directive 4.01 on Environmental Assessment

The World Bank 1994: Roads and the Environment: A Hand Book

The World Bank 1994: Road Maintenance and the Environment

The World Bank 1995: Operational Policies 4.04 on Natural Habitats

The World Bank 1995: Papers on Social Assessment

The World Bank 1995: National Environmental Strategies: Learning from Experience

The World Bank 1996. The Impact of Environmental Assessment; The World Bank's Experience

The World Bank 1997: Participation Sourcebook

References/Baseline Documents

---

**Other relevant/available environmental guidelines and documents:**

Commission of the European Union 1993: Environmental Manual: Environmental procedures and methodology governing Lomé IV development co-operation projects

Commission of the European Union 1993: Environmental Manual: Sectoral Environmental Assessment Sourcebook

Asian Development Bank 1993: Environmental Guidelines for Selected Infrastructures Project

The World Conservation Union (IUCN) 1993: Environmental Synopsis of Ethiopia

Plancenter Ltd 1992: Environmental Impact Study of the Chida-Sodo Road Project, Ethiopia. African Development Bank Project.

**Physical and biological environment data of Ethiopia:**

Kazmin V. 1973: Geological map of Ethiopia. Scale 1:1,000,000. Ministry of Mines and Energy.

Gouin P. 1976: Seismic zoning of Ethiopia. Bulletin of the Geophysical Observatory, Ethiopia.

Tesfaye Chernet 1982: Hydrogeological map of Ethiopia. Scale 1:2,000,000. Ministry of Mines and Energy

Soil and Geomorphology map of Ethiopia. Scale 1:2,000,000. Ministry of Agriculture, 1982.

Mean annual rainfall map of Ethiopia. Scale 1:2,000,000. National Meteorology Service Agency 1982

Master Plan for the Development of Surface Water Resources in the Awash Basin. Ethiopian Valleys Development Studies Authority, Final Report, Vol. 4 and 9. 1989

Feasibility Study of the Birr and Koga Irrigation Project, Acres International Ltd, Canada, and Shawel Consult International, Ethiopia, March 1995

Ethiopian Wildlife and Natural History Society 1996: Important Bird Areas of Ethiopia.

**Statistics**

The 1994 Population and Housing Census of Ethiopia. Federal Democratic Republic of Ethiopia. Office of Population and Housing Census Commission. Central Statistic Authority.

- Results for Oromiya Region
  - Volume I: Part I. Statistical Report on Population Size and Characteristics, April 1996, Addis Ababa
  - Volume I: Part II. Statistical Report on Education and Economic Activity, April 1996, Addis Ababa

References/Baseline Documents

---

- Volume I: Part III. Statistical Report on Migration, Fertility and Mortality, April 1996, Addis Ababa
- Volume I: Part IV. Statistical Report on Housing Characteristics, April 1996, Addis Ababa
- Results for Harari Region
  - Volume I Statistical Report, September 1995, Addis Ababa
- Results for Dire Dawa Provisional Administration
  - Volume I Statistical Report, October 1995, Addis Ababa
- Results for Tigray Region
  - Volume I Statistical Report, November 1995, Addis Ababa
- Results for Amhara Region
  - Volume I: Part I. Statistical Report on Population Size and Characteristics, December 1995, Addis Ababa
  - Volume I: Part II. Statistical Report on Education and Economic Activity, December 1995, Addis Ababa
  - Volume I: Part III. Statistical Report on Migration, Fertility and Mortality, December 1995, Addis Ababa
  - Volume I: Part IV. Statistical Report on Housing Characteristics, December 1995, Addis Ababa
- Results for Affar Region
  - Volume I Statistical Report, December 1996, Addis Ababa
- Results for Southern Nations
  - Volume I: Part III. Statistical Report on Migration, Fertility and Mortality, June 1996, Addis Ababa
  - Volume I: Part IV. Statistical Report on Housing Characteristics, June 1996, Addis Ababa

Statistical Abstract 1995, Ethiopia, April 1996

**General data of Ethiopia:**

Spectrum Guide to Ethiopia 1995

**Sources of social, cultural, economic and health data:**

Trends in Developing Economies, World Bank, 1994

The socio-cultural and economic baseline data is based on several documents (books, studies, reports, articles and other relevant literature)

Lankinen, Bergström, Mäkelä & Peltomaa 1994: Health and Diseases in Developing Countries

List of Organizations, Institutions and Persons

---

## List of Organizations, Institutions and Persons Met/Interviewed during the Work

Ethiopian Roads Authority, ERA  
ERA District Office Manager, Gondar  
ERA District Office Manager, Adigrat

Environmental Protection Authority of Ethiopia, EPA

The World Bank, Addis Ababa

The Delegation of the European Commission

Ministry of Information and Culture  
Department of Archeology and Anthropology  
Department of Information

Ministry of Agriculture  
Ethiopian Wild Life Conservation Authority  
Land Use Policy and Planning

Forestry Department

Ministry of Economic Development and Cooperation  
Environmental Planning Unit

Road Transport Authority

Chairman of the Council of Representatives of the Hadiya Zone  
Economic Development Section Head of the North Wolo Zone  
Inspector of the Mashilaye Transport Association  
Accountant of the Mashilaye Transport Association  
Deputy Chairman of the Council of Representatives of the South Tigray Zone - Maichew town  
Traffic Policemen in Hirna, Asebe Teferi and Alamata towns  
Elders of the Robit town  
Residents in different villages/towns  
People interviewed by the roads

List of Organizations, Institutions and Persons

---

Participants representing the following organizations in Public Meetings:

Place     Dire Dawa  
Date     June 20, 1997

Representatives from:

1	Kulubi Saint Gabriel Church	Kulubi
1	Kulubi Town	Kulubi
3	Kulubi Peasant Association	Kulubi
1	Kersa Administration	Kersa
1	Education Office	Kersa
1	Agricultural Office	Kersa
1	Oromo Development Association	Kersa
2	Hirna Town	Hirna
1	Dire Dawa Administration	Dire Dawa
1	Dire Dawa Municipality	Dire Dawa
1	Planning Office	Dire Dawa
1	Public Works & Urban Development	Dire Dawa
1	Education Bureau	Dire Dawa
2	Agricultural Bureau	Dire Dawa
2	Agricultural Office	Dire Dawa
1	Trade Council	Dire Dawa
1	Food Complex Factory	Dire Dawa
1	Textile Factory	Dire Dawa
2	Chat Association	
1	Alem Maya Administration	Alem Maya
2	Alem Maya University	Alem Maya
1	Planning & Economic Devt Office	Harar
1	Public Works & Urban Devt.	Harar
2	Agricultural Bureau	Harar
1	Social Affairs	
1	Harar Beer Factory	Harar

Place     Awash Town  
Date     June 22, 1997

Representatives from:

2	Woreda Council	Awash
2	Awash Town Municipality	Awash
1	Awash Kebele	Awash
1	Women Affairs Office	Awash
1	Justice Office	Awash
1	Education Office	Awash

List of Organizations, Institutions and Persons

---

1	Trade and Industry Office	Awash
2	Public Transport Organization	Awash
3	Awash Business Community	Awash
	Awash residents	Awash
2	Elders of Awash Town	Awash
2	Awash National Park	Awash
1	Gewane Town	Awash
1	ERA	Awash
2	ERA	Awash-Gewane

Place Mekele  
Date June 26. 1997

Representatives from:

Alamata Administrative Council	Alamata
Southern Zone Administration	Maichew
Regional Administration	Mekele
Regional Administration	Mekele
Regional Council	Mekele
Public Works & Urban Development	Mekele
Planning Bureau	Mekele
Mining and Energy Bureau	Mekele
Justice Office	Mekele
EELPA	Mekele
Telecommunications	Mekele
Mekele Town Administration	Mekele
Mekele Town Administration	Mekele
Mekele Town Administration	Mekele
Rural Roads Authority	Mekele
Business Community	Mekele
Business Community	Mekele
Relief Society of Tigray	Mekele
Tigray Development Association	Mekele
Woin Newspaper	Mekele
The Press	Mekele
Eastern Zone Administration	Adigrat
Public Works & Urban Development	Adigrat

List of Organizations, Institutions and Persons

---

Place Hossaina  
Date July 8, 1997

Participants/Representatives from:

Amacho Wato town	Amacho Wato
Peasant Association	Limu
Peasant Association	Limu
Tiya town	Tiya
Business community	Butajira
Business community	Butajira
Hadiya Zone Council	Hossaina
Hadiya Zone Council	Hossaina
Hadiya Zone Council	Hossaina
Hadiya Zone Council	Hossaina
Education Office	Hossaina
Women's Affairs Office	Hossaina
Hossaina Municipality	Hossaina
Hossaina Town	Hossaina
Hossaina Hospital	Hossaina
Public Transportation Organization	Hossaina
Hadiya Development Association	Hossaina
Business community	Hossaina
Business community	Hossaina
Business community	Hossaina
Business community	Hossaina
Private investors	Hossaina
The Press	Hossaina
KAT Zonal Council	Durame
Public Works & Urban Development	Durame
Business community	Areka
Business community	Areka
Woreda Council	Shinshicho
Woreda Council	Shinshicho
Education Office	Shinshicho
Sodo Woreda Council	Sodo
Women's Affairs Office	Sodo
Business Community	Sodo
Business Community	Sodo

Plancenter Ltd

Addis Ababa

7 July 1997

### Minutes of meeting with the Ethiopian Roads Authority (ERA)

Client ERA

Subject Inception Report

Issued by Plancenter Ltd

Date 7 July 1997

Location ERA, Addis Ababa

Present	Ato Fekade Haile	ERA
	Ato Bekele Negussie	ERA
	Mr. Hannu Karttunen	Plancenter Ltd
	Mr. Reima Petäjäjärvi	Plancenter Ltd
	Ato Dejene Woldemariam	Local Expert, Plancenter Ltd
	Ato Imeru Tamrat	Local Expert, Plancenter Ltd
	Ato Mengistu Haile	Local Expert, Plancenter Ltd

- Topics
1. The consultant presented inception reports both for the sector EIA and the specific five roads EIA.
  2. The client had received the copies of the inception reports 30 June 1997.  
  
During the meeting the client made mutually some comments
    - guidelines for EIA of transport sector projects prepared by EPA (January 1997) will serve as a guideline for EA of road projects in Ethiopia.
    - some spelling mistakes and other minor comments
    - in general the contents of the reports are however adequate
  3. The consultant received the copies of the inception reports including all the comments made by the client.



Plancenter Ltd

Addis Ababa

18 July 1997

**Minutes of meeting with the Ethiopian Roads Authority (ERA)**

Client	ERA	
Subject	Introduction of Ms. Auli Keinänen, who had just arrived to the country, to Mr. Bekele.	
Issued by	Plancenter Ltd	
Date	18 July 1997	
Location	ERA, Addis Ababa	
Present	Ato Bekele Negussie Ato Mengistu Haile Ms. Auli Keinänen	Coordinator, ERA Local Project Coordinator, Plancenter Ltd Project Coordinator, Plancenter Ltd
Topics	Discussion on the extent of inclusion of capacity building and training needs to the Draft Final Reports.	

Plancenter Ltd

Addis Ababa

21 July 1997

**Minutes of meeting with the Ethiopian Roads Authority (ERA)**

Client	ERA
Subject	Discussions on the next day's workshop.
Issued by	Plancenter Ltd
Date	21 July 1997
Location	ERA, Addis Ababa
Present	Mr. Bekele Negussie, Coordinator, ERA Ms. Auli Keinänen, Project Coordinator, Plancenter Ltd Mr. Reima Petäjajarvi, EIA Specialist, Plancenter Ltd
Topics	Introduction of consultants' presentations for the Workshop on Sector EA issues to be held 22nd July at Hotel Imperial.

Plancenter Ltd

Addis Ababa

23 July 1997

**Minutes of meeting with the Ethiopian Roads Authority (ERA)**

Client	ERA
Subjects	Structure and time schedule of the Draft Final Reports
Issued by	Plancenter Ltd
Date	23 July 1997
Location	ERA, Addis Ababa
Present	Mr. Bekele Negussie, Coordinator, ERA Mr. Mengistu Haile, Local Project Coordinator Ms. Auli Keinänen, Project Coordinator, Plancenter Ltd
Topics	Seven different reports were requested: Five Individual Road EA Reports, Summary Report of those Five and the Sector Report  Time schedule for the submission of the Draft Final Reports was discussed as well as the date for the Final Meeting and for demobilization of the consultant.

Plancenter Ltd

Addis Ababa

31 July 1997

### Minutes of meeting with the Ethiopian Roads Authority (ERA)

Client	ERA
Subjects	Farewell meeting for Mr. Reima Petäjajarvi, who was leaving the country
Issued by	Plancenter Ltd
Date	31 July 1997
Location	ERA, Addis Ababa
Present	Mr. Bekele Negussie, Coordinator, ERA Ms. Auli Keinänen, Project Coordinator, Plancenter Ltd Mr. Reima Petäjajarvi, EIA Specialist, Plancenter Ltd
Topics	Discussions about the manning and responsibilities of the proposed environmental unit of ERA.

Plancenter Ltd

Addis Ababa

6 August 1997

**Minutes of meeting with the Ethiopian Roads Authority (ERA)**

Client	ERA
Subject	Time schedule of the reports
Issued by	Plancenter Ltd
Date	6 August 1997
Location	ERA, Addis Ababa
Present	Mr. Bekele Negussie, Coordinator, ERA Ms. Auli Keinänen, Project Coordinator, Plancenter Ltd
Topics	Suggestion for the time schedule for finalization and presentation of the Draft Final Reports was given by ERA; it was agreed that the Draft Final Sector EA Report can be finalized in Finland

**The Federal Democratic Republic of Ethiopia  
Ethiopian Roads Authority  
International Development Association**

**THE ENVIRONMENTAL IMPACT ANALYSIS OF THE ROAD  
SECTOR AND THE FIVE ROADS SELECTED FOR  
REHABILITATION AND/OR UPGRADING**

**Workshop**

**for the Environmental Impact Analysis of the Road Sector**

## **PROGRAMME**

- 08.30 Registration of participants**
- 09.00 Opening**  
Ato Tesfamichael Nahusenay, General Manager of the Ethiopian Roads Authority
- 09.15 Introduction of the Workshop purpose and programme**  
Ms. Auli Keinänen Project Coordinator, Plancenter Ltd, Finland
- 09.30 Introduction**  
All Participants
- 09.40 Road Sector Development Program**  
Ato Bekele Negussie RSDP Coordinator, ERA
- 10.10 Present Situation of Environmental Management in ERA**  
Ato Taddele Debela Planning & Programming Division, ERA
- 10.30 Coffee Break**
- 11.00 Environmental Policy of the FDRE and Environmental Impact Considerations for Transport Sector Projects**  
Representative of the Environmental Protection Authority
- 11.30 Experiences of the Social, Economic and Cultural Issues of Road Sector Projects**  
Ms. Ulla Mustanoja, Senior Sociologist, Plancenter Ltd, Finland
- 12.00 Lunch Break**
- 13.30 Experiences of the Main Environmental Concerns of Road Sector Projects & Experiences of the Institutional Framework and Cooperation Needs**  
Mr. Reima Petäjälä Senior Environmentalist, Plancenter Ltd, Finland
- 14.15 Group Work**  
Reima Petäjälä (introduction) and all participants
- 15.15 Group Work Presentations**  
Groups
- 16.15 Coffee Break**
- 16.45 Discussion**
- 17.15 Concluding Remarks**

**All the presentations include 5-10 minutes of discussion**

## **PARTICIPANTS**

### **Ethiopian Roads Authority:**

Ato Tesfamichael Nahusenay, General Manager  
Ato Bekele Negussie, RSDP Coordinator  
Ato Taddele Debela, Planning & Programming Division  
Representatives (Managers) of all Divisions (9)  
Ato Fekade Haile, Chief Engineer  
1 Representative of Public Relation & Information Branch  
Representative from Alemgena Training Center

### **Prime Minister Office**

1 Representative

### **Environmental Protection Authority:**

2 Representatives

### **Ministry of Economic Development and Cooperation**

1 Representative of the Environmental Protection Unit

### **Ethiopian Wildlife Conservation Organization**

1 Representative

### **Ministry of Agriculture:**

1 Representative of the Department of Forestry  
1 Representative of the Land Use Department

### **Ministry of Transport and Communication**

1 Representative

### **Regional Governments**

1 Representative of each

### **Transport Construction Development Enterprise**

1 Representative

### **Private Sector**

2 Representatives of the Chamber of Commerce

### **The World Bank**

1 Representative

### **European Commission**

2 Representatives



**The Federal Democratic Republic of Ethiopia  
Ethiopian Roads Authority  
International Development Association**

**THE ENVIRONMENTAL IMPACT ANALYSIS OF THE ROAD  
SECTOR AND THE FIVE ROADS SELECTED FOR REHABILITATION AND/OR  
UPGRADING**

**Workshop**

**for the Environmental Impact Analysis of the Road Sector**

**Plancenter Ltd, Finland**

**Addis Ababa  
22 July, 1997  
Hotel Imperial**

## **Environmental Impact Analysis of the Road Sector**

**Outline of the Introductory Presentation of Auli Keinänen  
at the Workshop 22.7.1997**

### **INTRODUCTION OF THE PROJECT**

- **BACKGROUND**
- **WHAT HAS BEEN DONE?**
- **WHAT WILL STILL BE DONE?**
- **TIME SCHEDULE**

### **ORIENTATION TO THE WORKSHOP**

- **PURPOSE OF THE WORKSHOP**
- **PROGRAMME OF THE DAY**
- **GROUP WORKS**

## **Environmental Impact Analysis of the Road Sector and the Five Roads Selected for Rehabilitation and/or Upgrading**

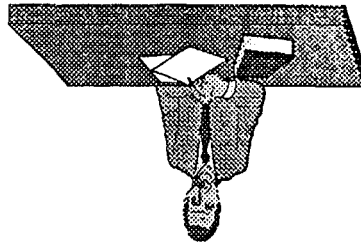
The Project consists of two types of studies:

- A Road Sector Environmental Assessment focusing on the sector planning process with the policy, regulatory and institutional framework, and on environmental principles, standards and guidelines for road projects
- Site Specific Environmental Assessments for each of the five planned road components:
  - Alemgena - Hossaina - Sodo Road
  - Woldiya - Adigrat - Zalambessa Road
  - Debre Markos - Gondar Road
  - Awash - Kulubi - Dire Dawa - Harar Road
  - Modjo - Awash - Mille Road

Objectives of the Project:

- to ensure that in-country capacity, regulatory framework, principles and procedures are established and will serve as the basis for environmental assessments of all future individual road constructions being carried out under the RSDP
- to identify and quantify - to the extent possible - the likely negative and positive environmental impacts of the proposed road work as presently designed and suggest and produce cost estimates regarding the required mitigating measures to be implemented to avoid these negative impacts

By: Bekele Negussie  
Planning & Programming  
Division



PRESENTATION OF RSDP  
ON  
THE WORKSHOP FOR THE ENVIRONMENTAL  
IMPACT ANALYSIS OF THE ROAD SECTOR  
- (JULY 22, 1997) -

THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
ETHIOPIAN ROADS AUTHORITY

## **Introduction**

The classified road network of Ethiopia totals about 23812 km, grouped into three broad categories of trunk, major link and regional roads which is among the lowest in Africa - 21 km per 1000 km<sup>2</sup> and 0.43 km per 1000 population. Much of this limited network is in poor condition. The consequences of this situation are manifold:

- vehicle operating costs on much of the network are high;
- much of the rural population has little access to the road network and relies on human or animal transport;
- transport consumes a substantial portion of household time, reducing the time available for income generation;
- market information and internal distribution are impeded and major price differences exist between producing and consuming areas; and
- food relief operations are often difficult and costly.

On the other hand, in the medium to long-term, Ethiopia's economic growth will continue to rely essentially on agriculture. The performance of agriculture and the sustainability of the existing economic recovery program will greatly depend on the condition and size of the road network to keep the basic economy in motion.

## **Strategy for Change**

The Government, in recognizing the critical state of the sub - sector and the serious bottlenecks in the economic development program caused by poor transport, has prepared the Road Sector Development Program (RSDP). This program provides a comprehensive approach to integrating the implementation of key road investments with major policy and institutional reforms.

The RSDP (1997-2007) plans to improve the condition of the existing network by an extensive program of rehabilitation and upgrading; and to expand the rural road network very substantially. The program is also intended to address road safety concerns, raise environmental standards for road construction and maintenance, improve network planning, and promote the role of the private sector. The first phase of the program (1997 - 2002) is expected to cost about Birr 16.570 billion (US\$ 2.50 billion) and to be parallel financed by IDA, EU, ADB, Germany, Japan, Italy, the Netherlands, ODA, NDF and the Government of Ethiopia.

The primary objective of the proposed program is to restore Ethiopia's road network, which have become an obstacle to the sustainability of the economic

development program, and to develop institutional capacity of the road agencies to properly manage the networks. The physical target of RSDP I is to have, 60% of the roads in good condition and to install regular maintenance on substantial amount of road networks.

### **Program Description**

*The RSDP I would consist of* - (a) civil work program including rehabilitation & upgrading of 6524 km of trunk roads, upgrading and construction of 2877 km of major link roads, rehabilitation & construction of 13442 km of regional roads and periodic maintenance on 2587 km of trunk & major link roads; (b) institutional support to strengthen Federal & Regional road management capacity, including support to domestic contractors, road safety and environment program; (c) road maintenance support program including improving exiting maintenance districts.

### **Preparatory Activities**

- **Policy and Capacity Building Issues**

*Road Fund and Roads Board* - The road fund legislation was approved by the Government and ratified by Parliament. To date Ethiopian Petroleum Enterprise is holding approximately Birr 58 million on behalf of the Road Fund. The preparation of a working procedure for the envisaged Roads Board is underway.

*Reform of ERA* - The ERA institutional reform study and proclamation to reestablish the organization which are of fundamental importance to the implementation of the RSDP are approved by the Government. The implementation of the Reform has commenced after the Council approved the organizational set up of the Authority.

*Sectoral Monitoring System* - A study financed by European Commission which delivers a system for monitoring performance indicators and recommendations on sectoral issues is underway with the final report due end July, 1997. A number of key performance indicators have been identified and an assessment of the availability of data has been carried-out. Following the study the performance monitoring of RSDP is to be made on an annual basis in collaboration with EC and will be made available for all donors.

*Road Safety and Axle Load Control* - The draft final TOR for both studies is communicated to European Commission. It is expected that the studies will commence in September, 1997.

*Transport Regulations* - The draft TOR is finalized. Some of the expected results of the study are - analysis and review of the present road transport legislation and regulations, the extent of competition, costs of the constraints that the road industry is facing and the impact to the economy, a framework of practical recommendations; and a realistic action plan aiming to promote Ethiopia's transport policy objectives.

*TA to ERA* - Three position (RSDP Advisor, Contract Administrator and Transport Economist) financed by EU will be filled by September, 1997 while a team of four members already placed with the assistance from DfID of UK.

*Private Sector Development* - The Notice to be appeared on the Development Business Magazine of the World Bank to enable the Consulting Firms express their interests is sent to the World Bank.

*Environmental Impact Analysis* - The World Bank is financing a short-term identification study which is expected to recommend further steps by September, 1997. There is an understanding that EC may finance future activities based on the study findings specially to develop ERA's capacity in this endeavour.

*Village Level Travel and Transport* - The Notice to be appeared on the Development Business Magazine of the World Bank is sent to the World Bank.

*Support to Rural Roads Authorities*- In view of the expected integration of the rural roads components of 6<sup>th</sup> EDF on-going projects (i.e. CERUDEP and Coffee Improvement Project) as well as the likely rural road component of the present budget line and future EDF VIII, NIP, Food Security Projects, it is realized that there is a scope for addressing institutional issues of the regional road authorities. The European Commission through Food Security Scheme is also prepared to finance the technical assistance and civil work for substantial amount of rural roads. ERA and the Delegation started the joint visit of some of the regional road authorities to this effect. The project profile for construction of the Feresbet - Adet (120 km) to rural road standard has also been submitted to ADB for possible financing.

The World Bank, in conjunction with the Nordic Development Fund (NDF), is prepared to provide financing for consultancy services for the implementation of the selected rural roads improvements. The strengthening and support is to include: (a) provision of technical assistance and capacity building of selected Road Departments of the Regions in respect of project preparation, prequalification, bidding, evaluation, contract award and implementation;

and (b) provision of consulting services for economic feasibility studies, detailed engineering designs, and preparation of contract documents.

- **Road Building Activities**

The feasibility study and detailed engineering design & tender document preparation is well advanced for most of the projects under RSDP.

The evaluation of bid for the rehabilitation of the Addis - Awassa (275 km) road is completed whose civil work will commence shortly. The preparatory activity for Addis - Woldiya road (521 km), Addis - Jimma road (335 km), Combolcha - Mille road (128 km) and Alemgena - Hossaina - Sodo (320 km) is also progressing.

The rehabilitation and upgrading of about 1200 km of main roads will be financed by World Bank at first tranche and invitations to contractors to prequalify have already been advertized. Various projects financed by other donors such as Germany, Japan, Italy, the Netherlands will be ready for implementation shortly.

Annex I and II show the detailed civil work and policy support projects to be performed under RSDP I.



## REHABILITATION OF TRUNK ROADS

It. No.	Road Projects	Total Length (in km)	Surface Type	Proposed work	Estimated Cost (In Million Br.)	Unit Cost in million Birr (1995)	ADT (1995)	Possible Financier	Corridor
1	Mille-Assab	196	A.S.D.	A.C.O	247.489	1.263	739	IDA	Import-Export
2	Semera-Elidar	134	A.S.D.	A.C.O.	169.202	1.263	439	ADF	"
3	Addis-Modjo	72	A.C.O.	A.C.O.	90.908	1.263	2654	EU	"
4	Addis-Gedo	185	A.S.D.	A.C.O.	255.868	1.383	606	KFW	Western
5	Addis-Jimma	335	A.S.D.	A.C.O.	422.974	1.263	583	EU	S.western
6	Modjo-Awasa	200	A.S.D.	A.C.O.	252.522	1.263	1060	EU	Lakes
7	Awash-Mille	308	A.C.O.	A.C.O.	557.856*	1.811	632	IDA	Import-Export
8	Modjo-Awash	155	A.C.O.	A.C.O.	280.739*	1.811	1387	IDA	Import-Export
9	Addis-Woldiya	521	A.S.D.	A.C.O.	690.711	1.326	460	EU	Northern
10	Addis-Debre Markos	299	A.S.D.	A.C.O.	420.534	1.406	383	Japan	N.Western
11	Nazareth-Assela	77	A.S.D.	A.C.O.	112.663*	1.463	672	IDA	Wabi
12	Harar-Dengego	30	A.S.D.	A.C.O.	62.512*	2.084	990	IDA	S.Eastern
13	Kulubi-Dire Dawa	53	A.S.D.	A.C.O.	110.440*	2.084	981	IDA	Eastern
	<b>Total</b>	<b>2565</b>			<b>3674.418</b>	-			

\* 1997 Price

## Annex 1-2

## UPGRADING OF TRUNK ROADS

It. No	Road Projects	Total Length (In km)	Surface Type	Proposed Work	Estimated Cost (In Million Bir.)	Unit Cost in million Birr (1995)	ADT (1995)	Possible Financier	Corridor
1	Jimma-Mizan	198	Gravel	A.S.D.	196.454	0.992	117	GOE	S.Western
2	Sodo-Arbaminch	118	Gravel	A.S.D.	110.559	0.937	213	GOE	Southern
3	Woldiya-Zalambessa	412	Gravel	A.C.O.	744.264*	1.806	236	IDA	Northern
4	Debre Markos-Gondar	439	Gravel	A.C.O.	824.785*	1.879	182	IDA	N.Western
5	Gondar-Mereb River	424	Gravel	A.C.O.	921.166*	2.173	135	IDA	N.Western
6	Nekempte-Ghimbi	113	Gravel	A.S.D.	165.337*	1.463	280	IDA	Western
7	Ghimbi-Assosa	234	Gravel	A.S.D.	342.378*	1.463	71	IDA	Western
8	Metu-Gambella	176	Gravel	A.S.D.	190.819	1.084	81	-	Baro
9	Dembi-Bedelle	63	Gravel	A.S.D.	72.464	1.150	227	-	Baro
10	Alemgena-Hossana-Sodo	328	Gravel	A.S.D.	477.453*	1.456	226	ADB	Southern
11	Arbaminch-Jinka	246	Gravel	Gravel	214.861	0.873	170	GOE	Southern
12	Asela-Dodolla-Goba	300	Gravel	A.S.D.	438.946*	1.463	216	IDA	Wabi
13	Jijiga-Gode	569	Gravel	Regravelling	172.887	0.304	258	IDA/GOE	S.Eastern
14	Harar-Jijiga	102	Gravel	A.S.D.	102.751	1.007	303	-	S.Eastern
15	Awash-Kulubi	237	Gravel	A.C.O.	493.853	2.084	273	IDA	Eastern
	<b>Total</b>	<b>3959</b>			<b>5468.977</b>				

\* 1997 price

## Annex 1-3

## UPGRADING OF MAJOR LINK ROADS

It No.	Road Projects	Total Length (km)	Existing Surface Type	Proposed Work	Estimated Cost (In Million Birr)	Unit Cost in million Birr (1995)	ADT (1995)	Possible Financier
1	Holeta-Muger	75	Gravel	A.S.D.	74.414	0.992	270	GOE
2	Combolcha-Bati	48	A.S.D.	A.C.O.	75.984	1.583	354	EU
3	Bati-Mille	80	Gravel	A.C.O.	81.757	1.022	240	EU
4	Dubti-Assaita	49	Gravel	A.S.D.	51.578	1.053	54	GOE
5	Adigrat-Adwa	108	Gravel	A.S.D.	158.022*	1.463	225	IDA
6	Woreta-Woldiya	300	Gravel	A.S.D.	425.632*	1.419	195	IDA
7	Shashemene-Dodola	77	Gravel	A.S.D.	85.987	1.117	273	EU
8	Modjo-Ejere	76	Gravel	Gravel	27.574	0.363	343	GOE
9	Mazoria-Durami-Durgi	75	Gravel	Gravel	27.211	0.363	-	GOE
10	Bonga-Amaya-Chida	110	Gravel	Gravel	41.106	0.374	55	Netherlands
11	Kebridehar-Shilabo	89	Track	Gravel	29.548	0.332	-	IDA/GOE
12	Gonder-Humera	250	Track	Gravel	188.343	0.753	103	Regional Project
	<b>Total</b>	<b>1337</b>			<b>1267.156</b>			

\* 1997 Price

## CONSTRUCTION OF NEW MAJOR LINK ROADS

It. No.	Road Projects	Total Length (Km)	Estimated Cost (In Million Birr)	Unit Cost in million Birr (1995)	ADT (1995)	Financier
1	Chida-Sodo	75	150.992	-	-	ADF
2	Indasellassie-Humera	168	160.800	-	-	GOE
3	Azezo-Meterna	175	148.397	0.848	76	GOE
4	Dera-Mechara	226	255.577	1.131	-	GOE/IDA
5	Watcha-Maji	135	114.477	0.848	-	-
6	Debrework-Combocha	250	377.910	1.512	-	Italy
	<b>Total</b>	<b>1029</b>	<b>1208.153</b>			

**FIVE YEAR INVESTMENT PROGRAM  
FOR REGIONAL ROADS**

<b>Regions</b>	<b>Proposed Regional Roads for Construction (In Km)</b>	<b>Total Cost (In Million Birr)</b>
Tigray	683	229.450
Afar	475	168.850
Amhara	1009	334.750
Oromia	1047	358.610
Somali	435	155.270
Benishangul-Gumuz	452	160.040
Southern	1033	352.030
Gambella	265	93.950
<b>TOTAL</b>	<b>5399</b>	<b>1852.950</b>

## RSDP Policy Support Project

Annex 2-1

Project Component	Project sub-component	Source of Finance	Cost (In million Birr)	Timing (Beginning)
1. Increasing Capacity of local private Contractors	Domestic contractor capacity building needs study	IDA/Japan/EC	3,274*	September, 1997
2. Resource mobilization and Road financing	Study to establish a Road Fund	GOE/GTZ		September, 1996
	Macroeconomic budget analysis	IDA/GOE	na	September, 1996
	Donor Coordination and Support	EC	4.070	June, 1997
3. Strengthening the administration and management of the road sector	ERA Reform Study	GOE/GTZ	2.532	On-going
	Planning, Programming and contract administration	EC	6.105	September, 1997
	Contract Adm. & Operations Division	ODA	8.048	March, 1997
	Regional Rural Roads organizations study	GTZ		
	ERA Cost accounting and financial management system	IDA	2.089	September, 1997
	Design manual and standard specification study	IDA	6.430	April, 1997
	Three Experts (ERA)	IDA	11.934	Nov. 1997
Eight Experts (Region)	IDA	22.277	Nov. 1997	
4. Human Resource Development	Strengthening Alemgena training Center	Japan	52.229	
	Strengthening Ginchi training Center	GOE	4.612	On-going
	Establish appropriate incentives for staff	GOE		September, 1997
	Training needs study and staff training program	GTZ/IDA/EU	4.000	On-going
5. Equipment and workshops	Establish semi-autonomous equipment departments within ERA (cost centers)	GTZ/GOE		Part of reform study
	Encourage the private sector to establish plant leasing operations	IDA/GOE/EU		Part of item no. 1.
6. Rural transport Services	Village level transport pilot project	Japan/IDA	0.398	September, 1997

## Annex 2-1 cont'd

Project Component	Project sub-component	Source of Finance	Cost (In million Birr)	Timing (Beginning)
7. Transport Safety	Reviewing and Updating national legislation	EC	2.198*	September, 1997
8. Labour based technology	Labour based technology for regional roads.	GOE	-	on-going
9. Environmental impact	Environmental effects will be assessed in conformity with environmental protection requirements (Environmental Guidelines)	EC	2.198*	October, 1997
		IDA	0.506	May, 1997
10. Network Planning	RFCS & PMS	IDA	6.021	August, 1996
11. Axle load enforcement	Axle load enforcement capacity strengthened New Axle load legislation will be introduced	EC	2.198*	September 1997
12. Road transport service	Further refine policy so that competition between transport operators is further intensified	EC	2.198*	October, 1997
13. RRD-Capacity Building	Design Unit Establishment	GOE	40.520	End 1997
	Office Building	GOE	39.000	On-going
	Office Furniture	GOE	5.380	On-going
	Garage Tools & Equip.	GOE	48.030	End 1997
	<b>TOTAL</b>		<b>276.247</b>	

\* Part of 2 million ECU project could be reduced or increased depending on the need of other areas.

# **CURRENT STATUS OF ENVIRONMENTAL MANAGEMENT IN THE ETHIOPIAN ROADS AUTHORITY**

A Paper Presented on  
the Workshop for Environmental Impact Analysis  
of the Road Sector

By: Taddele Debela  
July 22 1997

## **The Basics**

Environment could be divided into two major parts as follows:

### **1. Natural and physical environment including:**

- Soil and erosion
- Air quality
- Water
- Natural environment (Flora and fauna)

### **2. Social and human environment**

- ◆ Community life and economic activities
- ◆ Land acquisition and resettlement
- ◆ Road safety
- ◆ Cultural heritage
- ◆ Aesthetics and landscape
- ◆ Noise
- ◆ Indegenous or traditional populations

The nature of different projects, including road projects, is different regarding their impacts on the environment. Projects could be undertaken at least under one of the following categories:



Category I: Operations conceived and designed specially to improve environmental quality. No EIA is required for such projects.

Category II: Operations that have no direct or indirect environmental impact. No EIA is required for such projects.

Category III: Operations which may have a moderate impact on the environment, and have recognized and well defined solutions. A semi-detailed or detailed EIA may be required.

Category IV: Operations which may have significant negative impacts on the environment ( including indigenous populations and other vulnerable groups in the area of influence of the project).A detailed EIA is required.

Road projects typically fall in Category IV.

## Background

Environmental Impact Assessment for road projects has never been a usual practice in the sector. Rather, project viabilities were used to be evaluated from the socio-economic perspective in almost all the cases.

However, efforts were made at different times especially since 1993 when the Ethiopian Roads Authority in cooperation with the then Ministry of Natural Resources and Environmental Protection, with the initiative of the latter, has participated in the study of the "Conservation Oriented Rural Roads Programme in Ethiopia". It was a Swedish International Development Agency (SIDA) financed project with the objective of assessing the impacts of low volume roads on the environment. Thus several awareness programmes were set at different parts of the country although they were not implemented finally.

In August, 1994, with the assistance of the Finnish National Road Administration (FinnRA), an awareness towards the impacts caused by road maintenance and

workshop activities was attempted to be created and a workshop on the issue was held at the Conference Hall of the Alemgena District.

Later, in November, 1995, an other workshop sponsored by the above same organization was held at the Alemgena Training Center aiming at developing environmental policies and skills in the Ethiopian Road Administration.

In September, 1996, the Authority had revealed its concern to the environment through its participation on a workshop held with a sponsorship of the Environmental Protection Authority. The objective of the workshop was to hold a discussion on the Draft Provisional EIA Procedures for Ethiopia with Specific Reference to Agricultural and Industrial Development Projects in the presence of several experts in the field and representatives from different pertinent organizations including the Ethiopian Roads Authority.

The above activities of the Organization in relation to environmental-related activities reveal that there has been significant effort (at least at awareness level) towards combating the negative environmental impacts resulting from road projects.

### The Status Quo

It is obvious that in addition to the ever increasing demand for environmentally friendly road projects, the Ethiopian Roads Authority has developed an immense awareness to reverse the trend of neglecting the environmental impact of roads.

On this basis, the Ethiopian Roads Authority has taken the initiative to include the environmental impact due to road construction and/or maintenance during any project appraisal process.

Therefore, a Contract Agreement was entered between the Ethiopian Roads Authority (the Client) and Plancenter Ltd. (the Consultant) of Finland to conduct an Environmental Impact Analysis of the Road Sector and the Five Roads Proposed for Rehabilitation/Upgrading and currently the above mentioned Study is under way.

On the other hand, the Ethiopian Roads Authority has the proposal to establish a separate entity in charge of conducting Road Safety and Environmental Impact Assessment prior to realizing any road project in the future. The impact analysis (Environmental Impact Statement) would be in harmony with the national environmental guidelines of the country.

### Looking into the Future

As stated earlier, the Ethiopian Roads Authority would conduct EIA for road construction and/or maintenance. In addition, proper awareness programmes would be carried out for ERA personnel involved in activities with adverse effect on the environment. These may include: crusher sites, warehouse and garage activities, transportation of hazardous materials, etc.

Thus, with enormous effort to significantly reduce environmental impacts resulting from road works, it could optimistically be thought that future Ethiopian roads would be friendly to the environment and safe to the users.

**Workshop 22.7.1997 in Imperial hotel  
Presentation of Ms. Ulla Mustanoja**

**THE FOLLOWING ISSUES/CONCERNS ARE  
BASED ON**

- \* interviews whith local people living by the road,**
- \* public consultations in Dire Dawa, Awash,  
Mekele and Hossaina**
- \* documents and other relevant literature and  
statistics**

**ACCEPTABILITY OF THE UPGRADING/REHABILITATION  
PROJECT**

- \* All people, both people living by the road and  
people/ organizations who use the roads for  
transitory traffic, accept the projects**
- \* The roads already exist and a resettlement or  
compensation questions will not arise in a  
large scale**
- \* However, there are differing ideas what  
should be done during the construction period**

## **PROBLEMS WITH THE PRESENT ROADS**

**Local people complain about**

**Dust**

- \* **causing accidents**
- \* **inconvenience for living**

**Accidents**

- \* **due to dust on gravel roads**
- \* **speed of traffic**
- \* **the condition of cars; no reliable breaks and/or other failures**
- \* **drivers do not follow traffic signs which exist**

**Loss of agricultural land and property**

- \* **for detours and other construction sites**
- \* **but also loss of present economic activities due to detours**

**Missing space for pedestrians and animals on and by a road**

- \* **missing road shoulders**
- \* **bad drainage**

### **Drainage problems due to several reasons**

- \* **missing culverts causing erosion**
- \* **secondary ditches build by ERA are taken back to cultivation by farmers**
- \* **the flooding between Hamusit and Addis Zemen where road acts as a dike.**

### **Quarry sites are often left as they are after construction is over**

- \* **causing new breeding sites for malaria mosquitoes and**
- \* **other water born diseases**
- \* **in some places people want the quarry sites for (planned) waterharvesting**

### **Delays in agricultural inputs/outputs**

- \* **fertilizers etc/ transportation of products to the national markets**

**The Afars are complaining that people escape the accident places without paying compensation**

### **ERA camps ruining the environment**

- \* **cutting of trees**
- \* **killing wild animals**
- \* **social problems between the locals and immigrants**

### **Complaints by people engaged in transitory traffic:**

- \* **Accidents due to the poor road condition in general**
- \* **Slippery roads on the mountaneous terrain - especially the mountaneous parts of Tigrey and Hararge region, but also in Hossaina**

### **Breakage of vehicles**

- \* **on the Woldiya-Zalambesa road the costs for busses only for tires amount to Birr 20,000 every three months**
- \* **delays in transportation**

### **Shortage/lack of gas due to the truck owners refusing to take to the roads**

- \* **it takes two days to drive from Assab to Mojo and four days from Mojo to Hossaina**

### **Animals on the roads**

### **Missing rest places between Awash and Mille**

- \* **Era camps would mitigate this problem**

## **BENEFITS**

- \* Despite of many problems locals feel that they benefit more from the road than what they loose or suffer. (Some individuals disagree)**
  
- \* The problems and accidents are seen to be 'inevitable' or 'normal' even when human life is lost - however regrettable. However, people also want improvements and different mitigation measures are seen necessary.**
  
- \* For the national economy and the development the transitory traffic is a must.**



## **ISSUES TO BE DISCUSSED**

### **Resettlement**

- \* **responsibility for resettlement - in law and in practice**
- \* **in case of the 'illegal' settlement**
- \* **in case of the tenants**
- \* **in case of migrants to the area (gender and ethnic issues)**

### **Compensation of the property**

- \* **in the case of a loss of an owner occupied house or other property**
- \* **in a case of a rented house, compensation for the lost rents**
- \* **in case of the lost economic activity such as a road side shop**
- \* **estimation of property - justification**
- \* **Resettlement or training in case of permanent loss of agricultural land should be provided**

### **ERA camps**

- \* **should be carefully planned to induce 'planned' local development.**

### **Indigenous people**

- \* **Escapes after accidents along the Awash-Mille road**

### **Women/Gender Issues**

### **Road Safety**

## **MITIGATION MEASURES**

### **Consultations**

- \* **Public consultations with different authorities, ministries, organizations was seen as "a big step forward" by participants**
- \* **Public consultations should be in several places along the trunk road especially for inter-agency purposes**
- \* **All stakeholders should have good information before consultations**
- \* **Especially women should be consulted**

## **Joint Committees including all stakeholders**

- \* could mitigate the problems**
- \* for resettlement and compensation**
- \* for location of the detours, quarry, camps and other needed construction sites**
- \* for location of springs, graveyards and other important places to be avoided during the construction**

## **Better traffic education**

- \* All road users should have better traffic safety education**
- \* Effective traffic inspection**
- \* Road signs for safety**

## **Better inspection of cars**

## **Inspection of the overloads**

# Biological Environment

- **Land Use**

- \* loss of forest, woodland, agricultural and grazing land through land clearance

- **Degradation of Ecosystem with Biological Diversity**

- \* Reduction of useful, valuable or indigenous fauna and flora
- \* Encroachment to precious ecology (nature reserves etc.)

- **Destruction of Wildlife habitat and impediment to movement of Wildlife**

- **Health and Safety**

- \* using quarries and borrow pits for water harvesting
- \* influx of construction workers
- \* risk of different accidents during construction time

# Physical Environment

## ● Methodology

- \* Desk top study of different maps, references and literature
- \* Discussions with the designers of the roads
- \* Visual inspections during the field trips

## ● Analysis

### \* Erosion - sensitivity classification:

Highly sensitive  
Sensitive  
Slightly sensitive  
Not sensitive

### \* Surface water resources and water quality

- some areas lack water - possible conflicts during construction
- temporary impacts to water quality during construction, risk of damage to the aquatic ecology

### \* Slope stability

- road cuts on hilly sections of roads
- roads crossing the Ethiopian Rift Valley

### \* Soil contamination by spills of hazardous materials

- improper disposal of used oils and lubricants
- accidental spills

# Sustainable Development

“Development satisfying the basic needs of the present generation while preserving future generations’ possibilities to satisfy theirs”

Sustainable Society →

Sustainable Mobility

Sustainable Transport System →

Sustainable Road Transport

Sustainable Road Management →



Environmental Assessment of the Road Sector  
Workshop, 22.7.1997

RP - Plan 2000

# Organizations dealing with Environmental issues

- \* **Environmental Protection Authority**
  
- **Ministry of Agriculture**
- **Ministry of Economic Development and Cooperation**
- **Ministry of Mines and Energy**
- **Ministry of Trade and Industry**
- **Ministry of Public Works and Urban Development**
- **Ministry of Water Resources**
- **Ministry of Information and Culture**
- **Ministry of Health**
  
- **Federal executive organs (including ERA)**
- **Regional bureaus**

# **Powers and Duties**

- **EPA**

- \* **to prepare environmental protection policy and laws and, upon approval, follow up their implementation**
- \* **to prepare directives and systems necessary for evaluating the impacts of social and economic development projects ; follow up and supervise their implementation**
- \* **to prepare standards that help in the protection of soil, water and air as well as the biological systems they support; follow up their implementation**



# **Powers and Duties**

- **Ministry of Agriculture**
  - \* **Laws and policies on the utilization of forest, wildlife and plant genetic resources**
  
- **Ministry of Economic Development and Cooperation**
  - \* **Ensure that Environmental Policy and impacts are considered in the country's planning process and monitor implementation of same**
  
- **Ministry of Mines and Energy**
  - \* **Preparation of laws on the conservation and utilization of mineral resources; licensing and supervising mineral prospecting and mining operations**
  
- **Ministry of Trade and Industry**
  - \* **Control and management of domestic and industrial waste; supervise large scale industries as well as industry established by foreign investors**

# **Powers and Duties**

- **Ministry of Public Works and Urban Development**

- \* **Formulate the country's urban development; undertake studies relating to urbanization patterns; on request from Regional Governments undertake urban studies and prepare urban master plans**

- **Ministry of Water Resources**

- \* **Prepare draft laws concerning protection and utilization of water resources; issue permits to construct and operate works on resources that transcend regional boundaries**

- **Ministry of Information and Culture**

- \* **Study Ethiopian pre-history, history and culture; make necessary provisions for the discovery, protection, study, maintenance and utilization of ancient monuments and other historical relics**

- **Ministry of Health**

- \* **Prepare laws regarding health**

# Legal Framework

## Constitution

- Decentralization
- Land tenure
- Peoples "environmental" rights
- The rights of women

## Environmental Policy

- part of the Conservation Strategy of Ethiopia
- the need for a Policy:
  - \* different sectoral development policies and strategies have been, or are currently being, formulated

## Environmental Impact Considerations for Transport Sector Projects (draft)

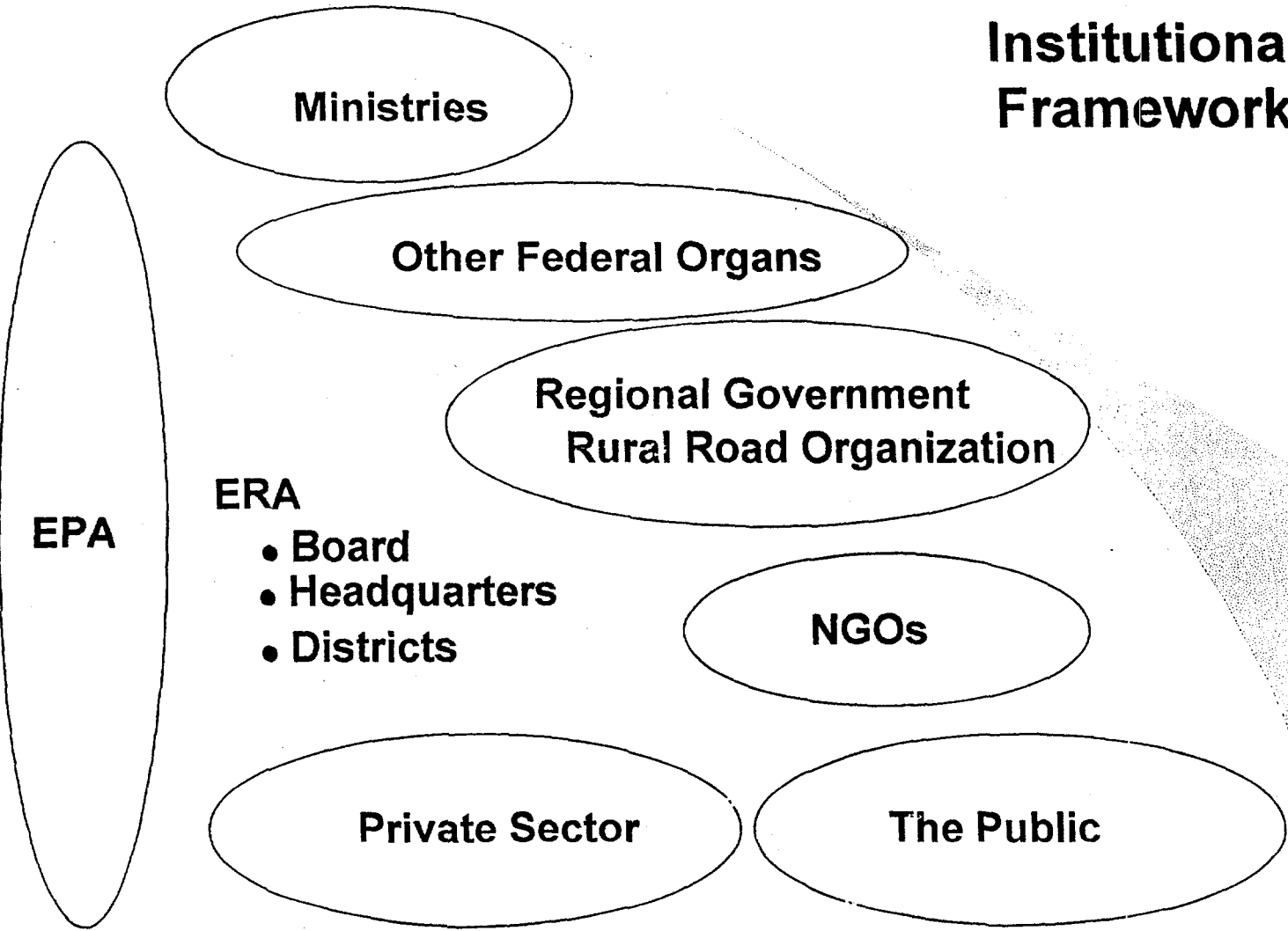
- Potential environmental impacts
- Checklist
- Suggestion for Terms of Reference for full scale EIA Study

## Environmental Impact Assessment

### Council of Ministers Regulations (draft)

- Regulations for carrying out the Assessment Process
  - \* duties and rights of different parties involved, including public participation
  - \* decisions & certificate
  - \* surveillance & public records
- Assessment of policies, strategies and programs?

# Institutional Framework



**Ministries**

**Other Federal Organs**

**Regional Government  
Rural Road Organization**

**EPA**

**ERA**

- **Board**
- **Headquarters**
- **Districts**

**NGOs**

**Private Sector**

**The Public**

INSURANCE  
ATION



SECURITY,  
INSURANCE  
ER  
T SERVICES,  
1, 51 90 77  
Telefax 517499  
2545

# The Ethiopian Herald

LIII—No. 262

Addis Ababa  
Wednesday 23 July 1997  
Hamle 16, 1989

Annual subscription—Birr 156  
Price 0.50

For Herald  
News Coverage  
157017  
157618

## RSDP envisages to improve existing road network

ADDIS ABABA (ENA) — The Road Sector Development Programme (RSDP) for the years 1997-2007 plans to improve the existing poor road network system, which has impeded the economic development, through an extensive rehabilitation and upgrading

programme.

This was disclosed yesterday at a day-long workshop which focuses on exchanging of views and ideas among concerned bodies in a bid to end up with a comprehensive and feasible environmental guide line that would assist the road sector to

have better road infrastructure in the future.

Opening the workshop, held at the auditorium of the Imperial Hotel here in the capital, Ato Tesfamicahel Nahusenay, General Manager of the Ethiopian Roads

See RSDP... page 2



Field Visit Programme

---

**FIELD VISIT PROGRAMME**

The Field Survey on the Five Roads 19.6.-8.7.1997

<b>Date</b>	<b>Road Section/Public Consultations</b>	
19.6.1997	Addis Ababa - Dire Dawa	Night in Dire Dawa
20.6.	<i>Public Consultation in Dire Dawa</i>	8.30 - 13.00
	Dire Dawa - Harar - Dire Dawa	Night in Dire Dawa
21.6.	Dire Dawa - Awash	Night in Awash
22.6.	<i>Public Consultation in Awash</i>	8.30 - 13.00
	Awash - Mille - Bati	Night in Bati
23.6.	Bati - Dessie - Woldia	Night in Woldia
24.6.	Woldia - Mekele	Night in Mekele
25.6.	Mekele - Zalambesa - Mekele	Night in Mekele
26.6.	<i>Public Consultation in Mekele</i>	8.30 - 13.00
	Mekele - Adigrat - Axum	Night in Axum
27.6.	Axum - Gondar	Night in Gondar
28.6.	Gondar - Bahir Dar - Dangla	Night in Dangla
29.6.	Dangla - Debre Marcos - Addis Ababa	
7.7.	Addis Ababa-Hossaina	Night in Hossaina
8.7.	<i>Public Consultation in Hossaina</i>	8.30 - 13.00
	Hossaina-Addis Ababa	

Persons attending the site visits:

Ms. Ulla Mustanoja	Senior Sociologist
Mr. Engida Zemedagegnehu	Hydrogeology/Soil Science/Road Engineering Expert
Mr. Dejene Woldemariam	Ecology/Natural Resources Management Expert
Mr. Atnafe Beyene	Sociologist
Mr. Taddele Debela	Counterpart from ERA

**SCOPING TABLE**

Potential Environmental Impact Area	Adverse Impacts	No Impacts	Beneficial Impacts	Evaluation Base
<b>I Physical and Natural Environment</b>				
1 Soil and erosion				
2 Hydrogeological conditions and water quality				
1.2 Stability of slopes				
1.3 Soil contamination by spills of hazardous materials				
1.4 Material use				
1.5 Ground subsidence				
1.6 Others				
<b>2 Water Resources and Water Quality</b>				
2.1 Changes in surface water hydrology				
2.2 Changes in ground water hydrology				
2.3 Sedimentation/Siltation				
2.4 Water harvesting				
2.5 Highway runoff pollution				
2.6 Others				
<b>3 Air Quality</b>				
3.1 Air pollution due traffic				
3.2 Others				

Potential Environmental Impact Area	Adverse Impacts	No Impacts	Beneficial Impacts	Evaluation Base
<b>II Natural Environment</b>				
<b>4 Biological and Ecological Changes</b>				
4.1 Changes in vegetation				
4.2 Impacts on important flora and fauna				
4.3 Degradation of ecosystem with bio-diversity				
4.4 Wildlife reserve				
4.5 Impairment of fisheries				
4.6 Encroachment into precious ecology				
4.7 Others				

Potential Environmental Impact Area	Adverse Impacts	No Impacts	Beneficial Impacts	Evaluation Base
<b>III Human and Social Environment</b>				
<b>5 Social issues</b>				
5.1 Social acceptability				
5.2 Resettlement				
5.3 Demographic changes				
5.4 Change in way of life				
5.5 Impacts on women				
5.6 Impact on native people				



5.7	Induced development				
5.8	Conflicts between locals and immigrants				
<b>6</b>	<b>Economic Issues</b>				
6.1	Loss of agricultural land				
6.2	Loss of property				
6.3	Employment opportunities				
6.4	Change of economic activities				
<b>7</b>	<b>Effects on Public and Private Services</b>				
<b>8</b>	<b>Health and Sanitary Issues</b>				
<b>9</b>	<b>Traffic Safety</b>				
<b>10</b>	<b>Cultural, Religious and Historical areas</b>				
<b>11</b>	<b>Damage to Aesthetic Sites</b>				
<b>12</b>	<b>Impacts on National Economy</b>				

ERA Questionnaire

---

**QUESTIONNAIRE FOR ERA (used mainly as a basis of discussion)**

Concerning the Road Sector Development Program and the Road Sector EA

The Ethiopian Roads Authority has prepared the Road Sector Development Program (RSDP). The program is planned for the years 1997-2007 and hence it will guide all road sector activities performed by ERA for the next decade. In the RSDP, ERA has reviewed the current status of the road network of Ethiopia, identified the key issues of Road Sector and set the strategic objectives for the Road Sector.

The RSDP is a comprehensive study and an ambitious program to develop the Ethiopian road management. In the program, all the necessary sections needed to achieve the goals concerning administration, planning, design, construction and maintenance of roads are included. Attention is also paid to issues concerning road safety (inc. regulative aspects), labour, training, procurement of equipment, rehabilitation of facilities and even some reasoning of different travelling modes (villages). Of all the sections mentioned above also some cost estimates are given.

For an impressive and massive development program, like the RSDP, an Environmental Assessment is considered necessary. The Ethiopian Roads Authority, as the Client, and the World Bank, as the funding organization, have contracted Plancenter Ltd, from Finland, to carry out the EA of the RSDP.

Besides assessing the environmental impacts of the RSDP, the work includes strengthening the organizations involved by analyzing capabilities, planning training, making suggestions for organizational structures and cooperation and producing guidelines in environmental management for ERA.

To work up a comprehensive Environmental Assessment of the RSDP and to make suggestions for the development of the Road Sector at large, it is essential for the Consultants to familiarize themselves with the existing situation in the organization. This questionnaire is produced to help the Consultants in that matter.

The Assessment is, as described in the Work Plan, complemented with interviewing relevant persons in ERA Management and also other experts if needed. And, corresponding questionnaires and interviews are also made among other Authorities dealing with the Road Sector and Environmental Issues in Ethiopia.

We kindly ask you to fill the questionnaire. If the space provided for the answers is not enough, please, use the back of the paper. The answers will be confidential and are used for the purpose described above only.

Due to the limited time for this study, the filled questionnaires should be back to us no later than on Friday the 18th July.

Thank you for your cooperation!

ERA Questionnaire

---

**1 The RSDP**

- 1.1 What is the status of the program in the strategic planning of the FDRE?
  
- 1.2 Which Authority distributed the assignment?
  
- 1.3 Are there any previous Road Sector programs? If any, describe the effects of the previous one(s) in broad outline
  
- 1.4 Are there any other sectoral programs being prepared simultaneously? If any, how are these programs taken into account when preparing the RSDP.
  
- 1.5 Which were the provisions for the preparation (economical, political, temporal)?
  
- 1.6 How was the preparation organized?
  
- 1.7 By which Authority were the objectives and the goals for the program established?
  
- 1.8 Were there any strategic choices made during the preparation of the program? If any, how were these choices managed?

ERA Questionnaire

---

- 1.9 Were there any Studies or Surveys carried out for the preparation of this particular program? Which?
- 1.10 Were there any different alternatives in any of the issues included into the program?
- 1.11 How were the alternatives dealt with? Which criteria was used?
- 1.12 How was the comparison performed?
- 1.13 Which impacts of the program were assessed/forecast?
- 1.14 Which kind of participation (public, governmental, cross-sectoral, sectoral) has been utilized?
- 1.15 How was the commencement/preparation informed (to public, other Authorities, etc.)?
- 1.16 Which criteria/basic data was used in cost estimates?
- 1.17 Which Authority is to approve of the program?

ERA Questionnaire

---

1.18 When is the program to be approved of?

**2 Organization/training**

2.1 What is the composition of the ERA Board at present?

2.2 Which kind of issues are decided by the Board?

2.3 Which Road Sector issues are managed by the Ministry of Transport and Communications and which by ERA? How do the MOTAC and the ERA communicate and cooperate?

2.4 With which Authorities/organizations ERA has regular cooperation concerning administrative, general cross-sectoral (incl. social and economical) and financial issues?

2.5 From your point of view, in which issues ERA needs more cross-sectoral and other cooperation and with which Authorities/Organizations.

2.6 What kind of environmental expertise is there at present in the ERA staff?

2.7 What is their education?

2.8 Is there any environmental training provided/planned (besides in the RSDP) in ERA's Training Centres?

ERA Questionnaire

---

- 2.9 What is the composition of the Environmental Unit planned in the Reform Study of ERA?
- 2.10 From your point of view, which kind of expertise is required into the new unit?
- 2.11 What is the job description of the new unit? Is it expected that the new unit would carry out the actual EAs or would the implementing of Eas be contracted to private Consultants?

**3 Planning Process/legal aspects**

- 3.1 Which other authorities/organisations are involved in the planning process of the roads governed by ERA?
- 3.2 What issues are dealt with the cooperation parties?
- 3.3 Has the cooperation been satisfactory/profitable? Any particular subjects to develop?
- 3.4 Which are the different design stages in the process at present? Is the process being revised?
- 3.5 What is the distribution in planning/design assignments between ERA staff and private Consultants?

ERA Questionnaire

---

- 3.6 Which other authorities/organisations are involved in the planning, design, construction and maintenance of the roads governed by the RGRROs and in which issues?
- 3.7 Are there any legal permits needed before the commencement of construction, upgrading and rehabilitation activities? If any, which? Which is the Authority awarding the permits?
- 3.8 Who is responsible for possible compensations?
- 3.9 How are compensations determined and settled?
- 3.10 Who is responsible for possible resettlements?
- 3.11 Are there any legal measures for ERA or other Institutions to prevent illegal settlements (or other land use) on the road reserve?

ERA Questionnaire

---

**QUESTIONNAIRE/INTERVIEW FOR THE EPA (used mainly as a basis of discussion)**

Concerning the Road Sector Development Program and the Road Sector EA

The Ethiopian Roads Authority has prepared the Road Sector Development Program (RSDP). The program is planned for the years 1997-2007 and hence it will guide all road sector activities performed by ERA for the next decade. In the RSDP, ERA has reviewed the current status of the road network of Ethiopia, identified the key issues and set the strategic objectives for the Road Sector.

The RSDP is a comprehensive study and an ambitious program to develop the Ethiopian road management. In the program, all the necessary sections needed to achieve the goals concerning administration, planning, design, construction and maintenance of roads are included. Attention is also paid to issues concerning road safety (inc. regulative aspects), labour, training, procurement of equipment, rehabilitation of facilities and even some reasoning of different travelling modes (villages). Of all the sections mentioned above also some cost estimates are given.

For an impressive and massive development program, like the RSDP, an Environmental Assessment is considered necessary. The Ethiopian Roads Authority, as the Client, and the World Bank, as the funding organization, have contracted Plancenter Ltd, from Finland, to carry out the EA of the RSDP.

Besides assessing the environmental impacts of the RSDP, the work includes strengthening the organizations involved by analyzing capabilities, planning training, making suggestions for organizational structures and cooperation and producing guidelines in environmental management for ERA.

To work up a comprehensive Environmental Assessment of the RSDP and to make suggestions for the development of the Road Sector at large, it is essential for the Consultants to familiarize themselves with the existing situation in the organizations involved with the road sector and environmental issues. This questionnaire is produced to help the Consultants in that matter.

The Assessment is complemented with interviewing relevant persons in ERA Management and other experts. And, corresponding questionnaires and interviews are also made among other Authorities dealing with Traffic Sector and Environmental Issues in Ethiopia.

We kindly ask you to fill the questionnaire. If the space provided for the answers is not enough, please, use the back of the paper. The answers will be confidential and are used for the purpose described above only.

All the questions might not seem relevant to your Institution. If so, you can skip those irrelevant to your Institution.

Due to the limited time for this study, the filled questionnaires should be back to us within five days.

Thank you for your cooperation!



ERA Questionnaire

---

**1 The RSDP**

- 1.1 Has the EPA participated in the preparation of the RSDP? If so, in which way: official Statement requested by ERA, unofficial discussions among experts or ...?
- 1.2 Do you know whether there are any other sectoral programs being prepared simultaneously? If any, do you know of any communication or cooperation between the organizations or between the EPA and the organizations??

**2 Environmental Policy, Guidelines, EIAs etc.**

- 2.1 We understand that the environmental policy of Ethiopia has already been approved. What steps are being undertaken by EPA to follow-up its implementation, especially as regards Environmental Assessment?
- 2.2 Which department in the EPA is responsible for preparing guidelines on EA for the road sector, and also preparation of laws and regulations?
- 2.3 It is understood that each sector is responsible for conducting EAs. How will the EPA monitor whether EAs have been properly made by the sector? Do you have in mind the preparation of regulations for such purpose?
- 2.4 We understand that a draft guideline for EA in the transport sector has been prepared. When do you expect this to be approved, and by whom?
- 2.5 Which impacts of the Environmental Policies and Sectoral Guidelines were/are being assessed/forecast?
- 2.6 Which kind of participation (public, governmental, cross-sectoral, sectoral) has been utilized in preparing Environmental Policies and Sectoral Guidelines?

ERA Questionnaire

---

- 2.7 Does the Environment Protection Council (?) play an active role in deliberating on policies, guidelines and standards for environmental management of the country? If not, why?
- 2.8 How does EPA coordinate its mandate with sectoral agencies at the federal and regional levels?
- 2.9 Do you foresee any reorganization within the EPA in the foreseeable future?
- 3 Organization/training**
- 3.1 The ERA has recognized the need to establish a new unit for environmental management. What type of set-up and composition would EPA recommend for this purpose?
- 3.2 Do you have any information on whether other sectoral agencies (both public and private) have established their own units?
- 3.3 From your point of view, in which issues would ERA need more cross-sectoral and other cooperation and with which Authorities/Organizations.
- 3.4 Is there any environmental training provided by EPA? If any, in which issues?
- 3.5 Could this training be provided (and modified if needed) for ERA staff?

## QUESTIONNAIRE FOR NON-GOVERNMENTAL ORGANIZATIONS

On the basis of Ethiopian Road Authority's (ERA) in-house preparatory activities and the results of the Road Transport Sector Study, the Government formulated the Road Sector Development Plan (RSDP) covering the period 1997 to 2007.

The RSDP aims to enhance and expand the Ethiopian road network over a ten year period and involves both road rehabilitation and construction of new roads. Detailed design of the individual road components will be developed gradually over this period. Environmental Assessment of the Program is required according to national policies, regulations and guidelines as well as to regulations of the financing institutions.

These questionnaires are preliminary for the Environmental Assessment for

- (a) the rehabilitation of the Mojo-Awash-Mille bitumen surfaced road;
- (b) the upgrading of the Alemgena-Hossaina-Sodo gravel road;
- (c) the upgrading of the Woldiya-Adigrat-Zalambessa gravel road;
- (d) the upgrading of the Debre Marcos-Gondar road; and
- (e) the upgrading/rehabilitation of the Awash-Kulubi-Dire Dawa-Harar gravel/paved road

We cordially ask Your Organization's view about the present environmental situation along the above mentioned road as well as the anticipated positive and negative impacts for the local communities during the construction period and after it.

If Your Organization is not active along the roads mentioned above, we nevertheless appreciate your general opinion and experiences about the social and environmental issues/ concerns which should be taken into consideration when constructing/ upgrading or rehabilitating the roads in the country.

We kindly ask you to fill the attached questionnaire, However, we welcome any additional comments and suggestions Your Organization can provide of the problems and wishes related to the use and construction of roads. If the space left for the answers is not enough, please, use the back of the paper.

The answers are received and studied by the independent consultants participating in the development of the Environmental Assessment (EA) for Road Construction for ERA. The answers will be confidential.

NGO Questionnaire

---

Due to the limited time for this preliminary study the filled questionnaires should be back to us no later than the 5th of July to

Plancenter Ltd  
P.O.Box 100086  
Addis Ababa  
[Fax number 614939]

Thank You for Your cooperation!

Questionnaire for NGOs for the ERA Environmental

Name of the NGO:  
Main office location:  
Type of activities:

Locations of the activities:

*Participation in decision making*

The road projects may have significant impacts to human and natural environment. Therefore, to avoid community or sectional opposition to the road project, the community members along the proposed road sites need to have an opportunity to be involved in an early stage in the planning process.

According to your opinion, how should this be done?

- Who are the individuals or groups who especially should be contacted?
- Especially for which road construction activities affecting people (loss of land, drainage design, location of schools etc.) should local people be contacted?
- Who/which ministry/ authority should have the responsibility to decide that environment will be taken into consideration

*Use of Road*

Which are the most important uses of the road by people living by the road?

Which of these activities would not exist without the road?

Who are the main users of the local roads?

- men
- women
- children
- shop keepers
- others such as

What should/ could be done with the domestic animals to avoid traffic problems?

NGO Questionnaire

---

*The Biggest Problems with the Roads*

What are the present problems with the existing road?

Which groups of people have problems with the road or who are suffering most of the road?

How these problems should/could be decreased or eliminated according to your judgement?

What type of measures - and by whom - can be taken to mitigate the anticipated problems caused by the upgrading/rehabilitation of the road

*Road Safety and Traffic Accidents*

Ethiopia has one of the highest frequency of traffic accidents in the world and hence the traffic safety should be increased on the roads.

- What are the biggest reasons for road accidents?
- What are the most "typical" accidents?

According to your judgement, what should be the first tasks to decrease the amount of accidents?

- Who should do it?

Has any of your vehicles had any accident on above mentioned roads (or on some other road)? If yes, what was the reason for accident?

- What happened after the accident, what measures were taken to deal with the accident?

*Compensation Issues*

In case of an traffic accident such as losing human life, what is the compensation system in practice?

What would be the just compensation due to the loss of farm land or other property to the road construction?

*Erosion*

Erosion is one of the major causes deteriorating /damaging the roads in Ethiopia. What are the biggest reasons for erosion along the road sides?

- Which human or village activities are causing the environmental problems such as erosion (or other problems) to the roads?

NGO Questionnaire

---

- What could /should be done to avoid these activities? Who should do?

*Road Construction Period*

Road construction needs machinery and labour, which disturbs the normal life of the road side people. What are the biggest problems caused by the construction work?

What are the social and environmental problems to the local people left behind by the road construction machinery or their storage?

What could/should be done to avoid or mitigate the problems?

What benefits are the construction workers/camps bringing to the area?

How could the benefits be increased or made permanent?

What problems are the construction workers /camps bringing to the area?  
What should be done to avoid the problems?

What should be taken into consideration during the upgrading/ rehabilitation of the road to mitigate the problems during construction period.

*Benefits from the improved roads*

What do you think will be the benefits from the improved road and why?

- to the community at large

- for the business community

- for governmental administrative staff

- to the communities along the road

- to tourism

- to any other persons/groups

NGO Questionnaire

---

*Settlement patterns*

Many people are settling down by the roads and build their houses there. What are the biggest reasons for that?

Who are the people who prefer to settle down by the road?

What are the reasons for the new settlements?

What should be done with the illegal settlements?

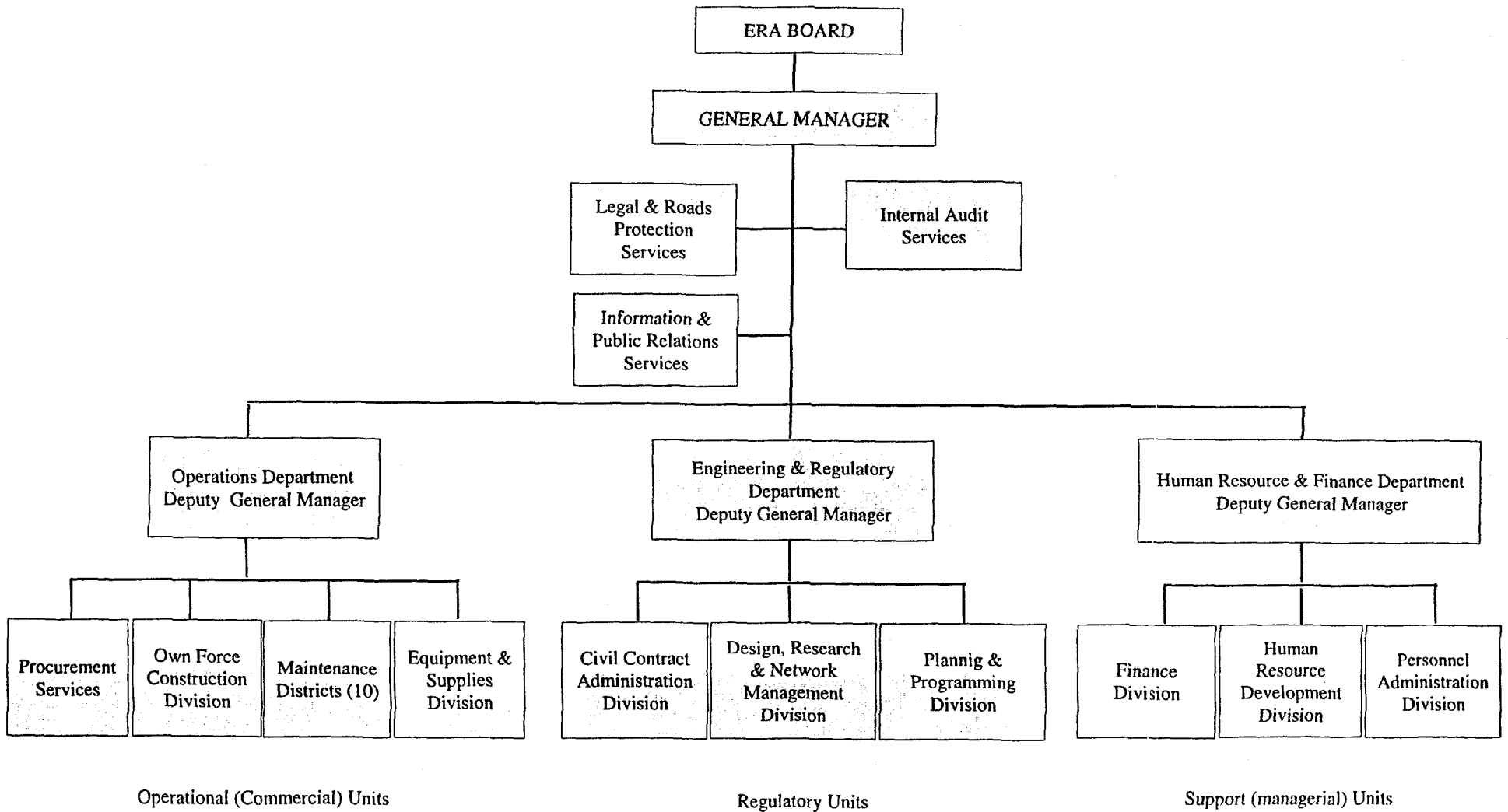
*Cultural and Historic Sites and Wild Life Sanctuaries*

How should/could they be taken into consideration?

**ORGANIZATION CHART OF ETHIOPIAN ROADS AUTHORITY**



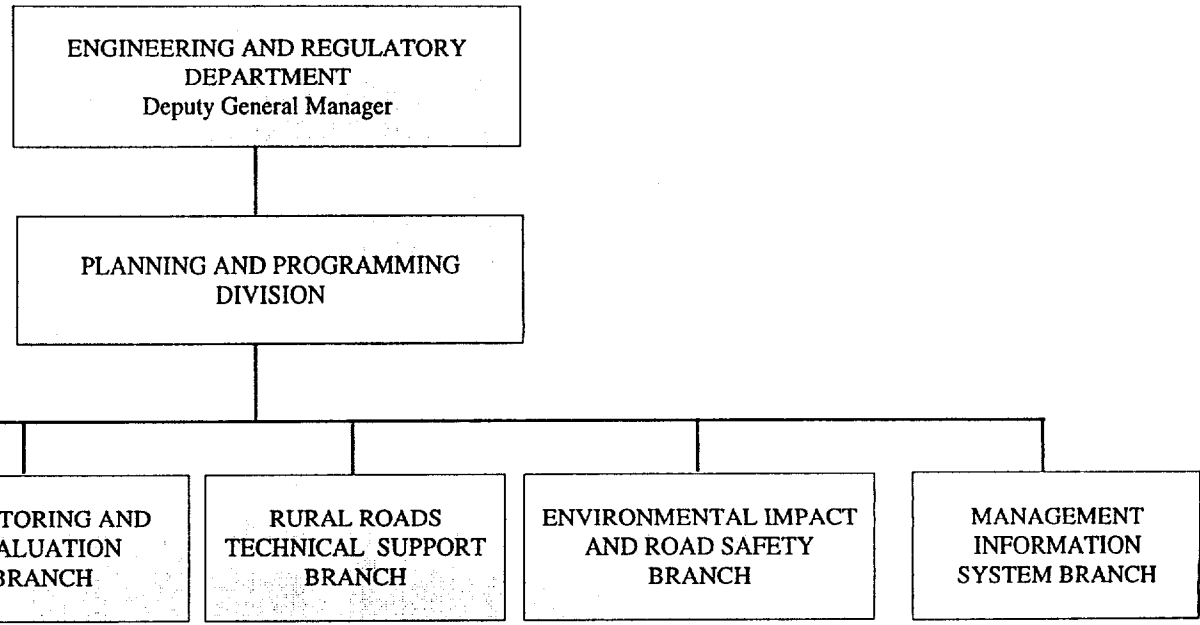
**ETHIOPIAN ROADS AUTHORITY  
ORGANIZATIONAL CHART**



Source: ERA-REFORM STUDY REPORT, REVISED SUMMARY- MAY 1997

**ETHIOPIAN ROADS AUTHORITY  
ORGANIZATION CHART**

**Planning and Programming Division**



Source: ERA - REFORM STUDY REPORT, REVISED SUMMARY - MAY, 1997

Baseline Data/Physical and Natural Environment

**Baseline Data/Physical and Natural Environment**

**Table 1 Faunistic Diversity in Ethiopia**

Group	Orders	Families	Genera	Species	Endemics
Mammals	13	45	144	260	22
Birds	21	84	306	845	27
Reptiles		6	36	78	3
Amphibians		7	19	54	17
Fish	5	14	33	101	4

*Source: Ethiopian Wildlife Conservation Organisation (1990).*

**Table 2 List of National Parks, Reserves and Controlled Hunting Areas**

- |   |   |
|---|---|
| 1. Abijaatta-Shalla Lakes NP            | 8. Nechisar NP                            |
| 2. Awash NP                             | 9. Omo NP                                 |
| 3. Babilie Elephant Sanctuary           | 10. Senkelle Swayn's Haretbeest Sanctuary |
| 4. Bale Mountain NP                     | 11. Semen Mountains NP                    |
| 5. Gambella NP                          | 12. Yabello Sanctuary                     |
| 6. Kuni-Muktar Mountain Nyala Sanctuary | 13. Yangudi-Rassa NP                      |
| 7. Mago NP                              |   |

**Table 3 The Principal Wildlife Conservation Areas of Ethiopia**

Wildlife Reserves		Controlled Hunting Areas	
Alledeghi	Tiro-Botor Bech	Afdem Gewane	Gojeb Chida
Awash West	Shire	Awash West	Tedo
Bale	Tama	Bale	Omo West
Chew Bahar	Bebeka-Guraferda	Borena	Murle
Chebera	Jibat	Boyo Swamp	Segen
Gewane	Chelbi	Dabus Valley	Akobo
Mille Sardo		Erer Gota	Arsi
		Mizan Tefferi	Chrcher & ArbaGuggu

**COMMENTS OF THE WORLD BANK TO THE INCEPTION  
REPORT**

L L - I N - 1 N O T E

DATE: 21-Jul-1997 11:37am EDT

TO: John Riverson ( JOHN RIVERSON )

FROM: Robert Tillman, AFTE1 ( ROBERT TILLMAN )

EXT.: 33307

SUBJECT: ETHIOPIA: Third Road Sector Project  
EA Inception Report

John,

I have reviewed the two inception reports for the EAs (Project Specific and Sectoral). Briefly stated, the reports are very well done and the team is to be commended on the rapid start and the well-defined work plan.

I strongly agree that the team's focus should be directed mostly on the project specific EA of five roads selected for upgrading, rather than the Sectoral EA. While both are important, the project specific EAs must meet the requirements of OD 4.01 in order for appraisal to take place. The project specific EA will be most immediately useful while the Sectoral EA will provide a basis for the Environmental Protection Authority to develop formal guidelines for the transport sector.

Some points in the inception reports merit special recognition. The participation component is very well done and should provide some very interesting insights as to people's perceptions of road work. In this context, the team has also recognized the importance of gender issues as they relate to the road sector. It is curious, however, that the excellent planning of the social aspects is not mentioned on page 15 under the method of study (Project Specific EA). Given the detail of the social planning that follows, the omission in the methodology is not at all serious.

The attention on institutional needs is welcome and this should be an important part of the EA. The team will need to recognize that ERA is quite weak in environmental analyses and the EA should not make a long list of sweeping changes that can not be implemented in a short period. The approach should be to identify the most critical needs and a recommended sequence of implementing changes over a realistic time frame. It is crucial that ERA endorse the recommendations with a view to implementing them as quickly as feasible. Part of this institutional analysis should include EPA as well. EPA, being a new institution, faces a period of growth and the EA team can make some suggestions or recommendations regarding EPA's present and future role in the environmental aspects of the transport sector. This is a question of where ERA can look to for technical assistance in environmental and social management issues.

I very much agree with the team that the sectoral EA would be most useful to Ethiopia in a guidelines approach. Data are too lacking to make a really useful Sectoral EA that would cover the

entire road system of Ethiopia. By necessity, the analysis would have to be so general that it's utility would be compromised. EPA aims to produce environmental guidelines for all of the important sectors, thus the Sectoral EA produced by the team will be an important starting point for EPA. If it is very well done, EPA could adopt the guidelines with minimum modifications and use them as a model for other sectoral guidelines.

My only other word of advice for the team is to concentrate on the most obvious issues in the project specific EA. For instance, so little is known about the current status Ethiopian wildlife, it would serve little purpose to dwell on a discussion in the report. Rather than focus on species, the focus should be on habitat protection. Where relatively undisturbed habitat exists, the road work should focus on keeping it relatively undisturbed. Perhaps this should be the most important point of the EAs - keeping the impact of road rehabilitation to a minimum, which is most likely the intent of the EA team.

I can not be more helpful simply because the team's planning and approach is so well done. It is a very ambitious plan and so little time, it will be difficult to accomplish all that they wish to do. I wish them well.

CC: Cynthia C. Cook	( CYNTHIA C. COOK )
CC: Jean-Roger Mercier	( JEAN-ROGER MERCIER )
CC: Edeltraut Gilgan-Hunt	( EDELTRAUT GILGAN-HUNT )
CC: Nina Chee	( NINA CHEE )

**COMMENTS OF THE WORLD BANK TO THE DRAFT FINAL  
REPORTS (e-mails 19.8.1997 and 21.8.1997)**

MR-Received: by mta NEPTN; Relayed; Tue, 19 Aug 1997 22:14:11 +0000  
MR-Received: by mta SMTPGW; Relayed; Tue, 19 Aug 1997 22:15:16 +0000  
Alternate-recipient: prohibited  
Date: Tue, 19 Aug 1997 18:54:59 +0000 (GMT)  
From: John Riverson <jriverson@worldbank.org>  
Subject: Ethiopia Third Roads Sector Project. EAs for the five roads  
Status of  
Report Completion  
To: int@suunnittelukeskus.fi  
Cc: Robert Tillman <rtillman@worldbank.org>,  
David Rudge <drudge@worldbank.org>, NEGEDE LEWI  
<nlewi@worldbank.org>,  
Belen Coronado-Garcia <bcoronadogarcia@worldbank.org>,  
"Yusupha B. Crookes" <ycrookes@worldbank.org>  
Posting-date: Tue, 19 Aug 1997 22:14:00 +0000 (GMT)  
Importance: normal  
Priority: normal  
UA-content-id: C245ZWZGQ25G4  
X400-MTS-identifier: [;11412291807991/1548452@WBWASH]  
A1-type: MAIL  
Hop-count: 2

TO:

Auli Keinanen  
Project Coordinator,  
Plancenter Ltd.

Many thanks for sending a copy of the EA reports for the 2  
roads:  
Modjo-Awash-Mille and Awash-Harar-Diredawa. We are  
currently  
reviewing the reports and will send you our comments  
before the  
meeting on August 29, 1997. As earlier mentioned to your  
team,  
the reports also need to be reviewed and cleared in the  
Bank  
before the appraisal mission can proceed. Your schedule  
of  
submission is therefore very suitable. We are trusting  
that the  
other reports not yet received are on the way and will be  
received by 8/22/97.

Please confirm by reply email where we are on this so we  
can make  
arrangements for their review since both Mr. Tillman and I  
will  
leave Washington on Friday 8/22/97. Best regards.

John



Robert Tillman, 21:58 21/08/97 +0, RE: Ethiopia. Your comments 20

MR-Received: by mta NEPTN; Relayed; Thu, 21 Aug 1997 22:25:09 +0000  
MR-Received: by mta SMTPGW; Relayed; Thu, 21 Aug 1997 22:26:17 +0000  
Alternate-recipient: prohibited  
Date: Thu, 21 Aug 1997 21:58:33 +0000 (GMT)  
From: Robert Tillman <rtillman@worldbank.org>  
Subject: RE: Ethiopia. Your comments 20.8.97 on the EA schedule  
To: Auli Keinänen <auli.keinanen@suunnittelukeskus.fi>  
Cc: John Riverson <jriverson@worldbank.org>,  
Robert Tillman <rtillman@worldbank.org>,  
NEGEDE LEWI <nlewi@worldbank.org>  
Posting-date: Thu, 21 Aug 1997 22:25:00 +0000 (GMT)  
Importance: normal  
Priority: normal  
UA-content-id: D1917ZWZIQBHN3  
X400-MTS-identifier: [;90522212807991/1588264@WBWASH]  
Al-type: MAIL  
Hop-count: 2

Auli,  
I am pleased that you are able to delay the presentation in Ethiopia until I will be able to be there. I am scheduled to arrive September 11, at 0955 and I will be staying at the Hilton.  
I have had an opportunity to review the first two reports and I am quite pleased with the reports. You managed to collect an impressive amount of material in the brief time that you had before for doing the field work.  
I have two major points that you may wish to work on the presentation. The first issue is with the Mojo-Mille road and it relates to the National Park and other protected areas. The report says that the Park Officials wish to have some input into deciding where the detours will be. I would make that a bit stronger and say that the park officials will decide. Our policies are very strict in regards to protected areas and at a minimum the park officials should decide where in the park a state detour would be suitable. The report should also clearly state that none of the borrow areas will be in the park. And, a suggestion would be to include a small sketch map showing the boundaries and where the road and the likely detour may be, or at least the detour that you would recommend based on your discussions with the park officials.

Printed for Auli Keinänen <auli.keinanen@suunnittelukeskus.f... I

The other major point is with resettlement in the Awash-Harar report. Please give an estimate of the number of households which may be relocated. Do not worry about a precise number at this point, that can be resolved later. The Bank is very uncomfortable in regards to involuntary resettlement and we have threshold numbers which would trigger a requirement for a detailed resettlement plan. It does not appear that the number of houses to be relocated will not be high enough to require a detailed resettlement plan, but an estimate should be stated in the report because we will be asked that question. Also in regards to resettlement, please remove the part about not compensating the households that are illegally in the right of way. Our policy is very clear that both legal and illegal households that have to be involuntarily resettled must be treated equally. We have discussed this with ERA and they agree to not differentiate between legal and illegal households.

One other point I would make is to make the section on HIV/AIDS much stronger. The contractors should be obliged to wage a more aggressive campaign to prevent AIDS, perhaps by hiring an NGO or Church group to conduct a health education program in the roadwork areas. Since truck drivers and construction workers are notorious for spreading AIDS in Subsaharan Africa, a health education campaign should be a minimum effort. Perhaps we can convince ERA to insist on a more proactive stance on the part of their contractors.

In the Awash - Harar report, page 24 has a missing section on fauna - the second paragraph seems to have been cut.

Someplace in the Awash-Harar report you mention home brewed beer as part of the local economy, but it came out as local bear.

I can not find it just now, but it is there.  
Looking forward to meeting you in Ethiopia.

**MINUTES OF THE FINAL WORKSHOP 15.9.1997**

**ENVIRONMENTAL IMPACT ANALYSIS OF THE ROAD SECTOR AND FIVE ROADS  
SELECTED FOR UPGRADING/ REHABILITATION****MINUTES OF THE FINAL WORKSHOP**

Time: Monday, September 15, 1997, 2-6 pm

Venue: ERA 4th floor meeting hall, Addis Ababa

Participants: List of attendance enclosed

1. Mr. Tesfamichael Nahusenay, General Manager of ERA, chaired the meeting.
2. The study team members introduced the key findings and conclusions:
  - Mr. Kari Leminen: General introduction of the study and the reports
  - Mr. Imeru Tamrat Yigezu: Policy Issues
  - Mr. Engida Zemedagegnehu: Physical Impacts
  - Dr. Dejene Woldemariam: Impacts on natural and biological environment
  - Ms. Ulla Mustanoja: Impacts on human and social environment
3. The General Manager of ERA as well as Mr. Robert Tillman and Mr. John Riverson from the World Bank expressed their views on main issues, which was followed by an active discussion and exchange of views. As a summary, the following issues will be further clarified in the final reports:
  - Resettlement and compensation of property: Number of housing units to be resettled will be estimated and a rough estimate for compensation cost will be worked out.
  - Environmental Health: Sexually Transmitted Diseases, AIDS in particular, need more emphasis. A plan of mitigation has to be proposed, e.g. a NGO to organize awareness campaigns and health education for local population and construction workers.
  - Awash National Park: It should be clearly stated that the park authorities will be consulted in the process of selecting detour locations within the park area.
  - ERA environmental Unit: A cost estimate will be worked out for the establishment and operation of the unit for the first five year period.

4. ERA and the World Bank indicated their satisfaction in the five road EA reports, the summary report and the sector EA report. It was agreed that the consultant shall elaborate the above mentioned matters into the final reports, in addition to the final editing. ERA will forward soon their written comments on the reports. The consultant proposed 2-3 weeks to be needed for finalization, which was acceptable to ERA and the World Bank.
5. It was pointed out that this is the first EA exercise of the road sector development programme in Ethiopia. In that respect the reports will be used among other things as reference reports or 'models' in the future EA studies. Keeping this in mind the summary report of the five roads is the one which will be read and used in wider extent than originally planned. It was therefore proposed that the summary report should be later translated into Amhara language.

**COMMENTS OF ERA TO THE DRAFT FINAL REPORTS  
(Comments received by the consultant 7.10.1997)**

Received by Plancenter Ltd  
by e-mail 7.10.1997

## Comments on Environmental Impact Analysis of the Road Sector

### General Comments:

The report is very well done, it is professionally structured and it does not reflect the short time available and the parallel effort of the consultant on the five project specific EIA studies.

New roads could present different alignment options. A section of an existing road causing high environmental impact could be by passed by a detour. Therefore, operative guidelines on alternative analysis should be added.

A pollution contingency plan both for construction and operating phases should be added.

In the Report, The Environmental Unit is stated as either "Environmental Impact Branch" or "Environmental Protection Branch". It is suggested here that both should be replaced by "Environmental Management Branch".

### Specific comments on Sector EIA

- Page 1-1** At the beginning of the executive summary it could be useful to add a brief summary of the scope of work of the document and the expected follow up, the background and the practical effects on the future projects.
- Page 1-3** Position EA Manager, first column, it is suggested to delete "Economist". It is also suggested to change "Msc Economics" in "Msc or equivalent degree in disciplines with environmental management background".
- Position "Engineer Specialist" First column, it is suggested to change with "Environmental Engineer Specialist". Second Column, it is suggested to delete "Environmental Modeling" or to shift it to the last rows. In fact, this position mainly has to liase with traditional engineering departments, to prepare TOR and to revise environmental studies and mitigating measure designs, to comment studies and to advise the EA Manager, while the direct implementation of environmental modeling is unlikely.
- There is any specific position for an expert in bio engineering, possibly an important field of action. The hydrogeologist position could be strongly oriented in that direction.
- It could be also useful to establish a prioritization of the positions in the event ERA spreads the recruitment of the team over a longer period.
- Page 1-6** The section "Human and Social Environment" should follow the same logical scheme of the previous chapter.

- Page 3-16** Chapter 2 is of very good quality. It is suggested to improve the structure sharing clearly from the description of the state of the art from the comments and/or the mitigation measures proposed. To add paragraphs stating the expected future developments could be very useful.
- Page 10, Sec. 2.3** The Ethiopian Roads Authority is not under the Ministry of Works & Urban Development. It is rather administered by a Board.
- Page 13** In the staging of the Environmental Unit, only EA Manager should be mentioned. Thus, delete "Economist".
- Page 18** It is not clear as to the methodology adopted. A table could be inserted explaining the results of the scooping splitting the checklists in construction and operating phases.
- Page 19** Fourth point of the list, change "Awar" in "Awash".
- Page 21** The table 4.1 and 4.2 are very useful and could be repeated for every environmental component. The last sentence of the first paragraph should be revised because, although relatively expensive, these measures can be necessary and/or economically efficient. Guidelines on topsoil conservation and restoration practices of the scarified sites and on the calculation of the optimal slope and height of terraces in quarries and borrow pits should be defined in order to reduce restoration costs.  
In the fourth paragraph it could be mentioned that the extraction of gravel and sand from large rivers could create serious impacts if the hydraulic profile is modified.
- Page 22** Point 4.3 Water resources could be used also for fishery activities. Swamp areas could be included in the receptors and discussed. Change "noice" with "noise".
- Page 25** The chapter should be structured as the previous one.
- Page 27** It is not mentioned the risk caused by road accident and the possible mitigating measures within villages (e.g. longitudinal and transversal physical obstacles, enlargement of the shoulder).
- Page 28** "Property to be compensated", second para., the very useful proposal for a different compensation in case of wood houses should be treated separately as mitigation. The same for the third sentence of the "Owner receiving compensation" Page 29.
- Page 34** The map on tourist areas does not show Axum and the rock churches as of tourist interest.



## **Comments on Road Specific Environmental Impact Analysis**

The comments given hereunder also apply to the other four road rehabilitation project EIA reports.

### ***1.0 Review Methodology (General)***

The comment considers the adequacy of the EIA report with regard to:

- conduct of the EIA process;
- examination of baseline data, impacts, mitigation plan and monitoring;
- Sufficiency of information;
- Presentation of information;
- overall compliance with the Terms of References.

The comments given in this reports also apply to the other four road rehabilitation project EIA reports.

### ***2.0 Conduct of the EIA process:***

The EIA study process adopted by the Consultants as indicated on page 3 of the EIA Report is adequate.

The composition of experts who conducted the study is also adequate. The Consultants attempt to carry out public consultations is also commendable.

The responses of NGOs to the questionnaires are not well reflected in the EIA report.

### ***3.0 Baseline Data/Project Description/Existing road environment:***

Adequate description of the project is given. A typical cross section of the road including the right of way is recommended to be included in this section of the report. All maps in the report should also show the main road (The Trans East African High Way).

The road environment is well described. The physical and biological environment sub-sections which include soils, geology, flora and fauna should be related to the road project and the potential impacts. The scientific descriptions should be analysed and the analysis in simplified terms should be related to the potential impacts and the road project. A drainage map showing rivers and major crossing (bridges) would have been helpful.

There are a number of recommendations included in this section. These recommendations should be treated in a separate chapter. These include: p.17 para.3, p.22 para. 6, P.26 para.3, P.27 para 2,5, P.31 para. 6, etc.

#### **4.0 Potential Environmental Impacts:**

A general weakness of this sections of the report is that, some chapters of the five EIA reports are similar and in some instances sections are directly replicated in all the volumes without even checking local names of towns, rivers, etc.

Please see the Alemgena report p.33 para. 5,7 and the Woldiya report p.35 para. 5 and p.38 para.1.

#### **4.1 Soil Erosion:**

This section should be re-written to reflect the actual soil erosion impacts that the road project will create during its construction and operation. Road side ditches which are constructed to divert surface drainage water to the adjacent lands are major contributors to soil erosion. This factor is not considered in the report. This and other factors indicated in the report should be quantified, to the extent, to properly plan and cost the mitigation measures.

#### **4.2 Slope Stability:**

This section should also be re-written as it does not refer to the appropriate and actual sections of the Alemgena - Sodo road.

Risk areas of slope instability should be indicated on maps and approximately quantified in terms of length of sections of the road which may need stability treatment.

#### **4.3 Soil Contamination:**

Camp and garage locations should also be indicated on the locations maps. Measures to ensure appropriate design of camps, garages and fuel stations should be included in the mitigation plan.

#### **4.4 Water Resources and Water Quality:**

Again this section should be re-written to reflect the appropriate sections and conditions of the Alemgena - Sodo road.

A drainage map and description of the drainage conditions should be part of this section. The section should address issues related to floods. The baseline data regarding rainfall, temperature, flows of Awash, etc., indicated in the annex of the report should be related to the discussions in this chapter. The section should also treat such questions as: Are there fish life and other life forms in the water bodies? Would they be affected by the project?

#### **4.5 Noise:**

Noise disturbance affects wildlife also and should be considered in places such as Boyo swamp and other protected areas.

The report should also identify noise sensitive areas and institutions such as schools, hospitals, residential areas, etc., and mitigation measures should be included in the mitigation plan.

#### **4.6 Natural Environment and Biodiversity:**

Sections 4.3.3 and the accompanying maps give a description of the flora and fauna along the road project.

It is not why clear section 5.2 offers no explanation on possible impacts of the project on the natural environment and biodiversity, atleast on the protected areas such as the Boyo swamp.

No mention is made on the use of the bridges and culverts for wildlife and domestic animal passages.

The strip of land and the environment between the Alemgena - Sodo and the Mojo - Mille road will experience cumulative impacts and this situation should be assessed in the Report.

#### **4.7 Human and Social Environment:**

This section treats most of the social issues influenced by the project. Two issues need to be mentioned here, since these will also influence the project. Road side markets for sale of agricultural and handicraft products to vehicular passenger will certainly increase due to the project. However, it is worth to assess how to reduce traffic accidents and reduce interference in traffic movement due to such activities.

The other issue concerns the practice of rural people using asphalted roads for various uses such as washing clothes, spreading agriculture products such as pepper to dry.

Simple considerations such as constructing small platforms (asphalt, concrete) at places where there are rural settlements to be used by rural people may reduce traffic accidents and minimize interference in traffic flow.

The road will encourage private entrepreneurs to open up other investment opportunities which will make significant changes in economic activities. This and other indirect impacts should also be discussed in this section.

Serious considerations should be given to cultural, religious and historical areas. The impacts associated with these issues should be dealt in detail. Locations and extent of these places should be identified and marked on maps.

Designers, constructors and those responsible for the operation and maintenance of the road should be made aware of what is expected of them in the protection of these cultural and historical sites.

The impact assessors should take note of the mode of use of the road which includes, domestic animals, animal drawn carts, water barrel pushes, pedestrians in addition to the normal traffic.

### ***5.0 Analysis of Alternative:***

The analysis of alternatives should consider any impacts due to realignment of the road if found necessary by the designers or the impact assessors.

### ***6.0 Mitigation Management Plan:***

The Mitigation measures are results of properly predicted and analysed impacts. It is therefore important to give due attention to the impact prediction, analysis and determination of impact significance.

The mitigation plan consists of essentially general prescriptions (e.g. embankment should be compacted) instead of quantified specific recommendations in the case of structural mitigation measures. In the case of non-structural measures these recommendations should be separated out and articulated for project designers and managers to include these recommendations in the pre-construction phase.

### ***7.0 Monitoring Plan:***

In addition to the descriptive presentation of the monitoring plan structured presentation, organogram type should be attempted in order to give a clear picture of the monitoring plan. Time frame should be stipulated (where possible) for the different activities and reporting requirements.

### ***8.0 Sufficiency of Information:***

Some of the information provided in the report are not quantified. (e.g. quarry site and grazing area, stability problem areas). Quantified information mentioned in the different parts of the report are sometimes not usefully utilized in the analytical discussions.

### ***9.0 Presentation of Information:***

The report is presented in an understandable manner but needs editorial work and some factual

errors (e.g. p.11 para 8 last sentence, p.26 para.9, p.33 paras. 5,7 etc.).

Several recommendations are scattered throughout the report. These should be presented in a suitable and consolidated manner to be used by decision makers.

The mitigation plan should be presented in relation to the various stages of the project i.e. during the study/design phase, the construction and the operation phases. The mitigation plan should be improved giving more emphasis to quantification and showing the cost implications.

### ***10.0 Overall compliance with the TOR:***

The Report is a good beginning for the road sector in the field of EIA. Keeping in mind the overall drawbacks of conducting EIA studies in an environment where there is shortage of experienced manpower, shortage of data and inavailability of legal and strong institutional framework, the consultants have produced a good EIA report.

The TOR should have been annexed to the report to assist reviewers to examine the overall compliance of the report with the TOR.

Regarding the Modjo - Awash - Mille Road, the following general comments are forwarded:

It was observed, during the site visit, that there were severe accidents on the road that are assumed to be due to several factors presumably like:

- inadequate sight distance (bushes on curves, etc.)
- absence of traffic signs
- drivers' capability
- drivers' psychology
- etc.

Based on the above accident factors, which one could be the most probable cause(s) for the motor accidents, and what are the mitigating/preventive measures?

It is obvious that quarry sites contribute significantly to the degradation of the environment. For instance, like on the Debre Markos-Gondarroad, the locations of quarry sites should be described along with their potential impacts on the environment.

**LETTER TO ERA 9.10.1997**  
**(re: sending Final Summary Report; commenting the comments received from ERA; and cost estimate for compensation of houses)**



PLANCENTER LTD

Helsinki/A.Keinänen

October 9, 1997

Ethiopian Roads Authority  
P.O.Box 1770  
Addis Ababa  
Ethiopia

Attn: Mr. Tesfamichael Nahusenay, General Manger

**ENVIRONMENTAL ASSESSMENTS OF THE ROAD SECTOR AND THE FIVE ROADS SELECTED FOR REHABILITATION AND/OR UPGRADING**

Dear Sir,

Attached herewith please find the ten (10) copies of the Summary EA Report (Final) for five roads selected for upgrading and/or rehabilitation. We are sending also the three (3) copies of the same report to the World Bank, Washington, by DHL.

This Summary Report was finalised first according to the wishes of the World Bank and ERA representatives at the Final Workshop in Addis Ababa 15.9.1997. The other Final Reports will be submitted by the end of October 1997, as requested by ERA.

We are also attaching a separate paper about cost estimate for new buildings needed on Awash-Kulubi-Dire Dawa-Harar Road for your possible comments. We will include the estimates to the Final Report for that road.

We received comments from ERA on the draft final reports. We find the comments very good and are taking most of them into account in the Final Reports. However, we feel that some of the requirements such as adding operative guidelines on alternative analysis and preparing pollution contingency plans for construction and operating phases cannot be fulfilled within the time and financial frames of this study.

Yours faithfully,

PLANCENTER LTD

Auli Keinänen  
Project Coordinator

ANNEXES      Cost Estimate for new buildings needed on Awash-Kulubi-Dire Dawa Road  
ENCL.         Ten copies of Final Summary Report

**Cost Estimates for Building New Houses for Displaced People****I By Awash-Kulubi-Dire Dawa-Harar Road**

We estimate that about 120 houses / buildings will be demolished / removed by this road. Depending on the size of the new houses the total costs will vary. The square meter price of a ready hollow block house is about 1200 Birr.

Assuming a house of two rooms, kitchen and a space for toilet (40m<sup>2</sup>) the price would be 48,000 Birr. (For the estimations we accepted the high standards.)

Total maximum costs will be for 120 houses 5.7 million Birr.

**II By Woldiya-Adigrat-Zalambessa Road**

We estimate that only some tens of houses will be removed.



**TERMS OF REFERENCE  
(ERA, September 1996)**

---

## APPENDIX A

### DESCRIPTION OF THE SERVICES

#### INTRODUCTION

The road system of Ethiopia is currently inadequate for the transportation needs of the country. The road density is 21 km per thousand sq.km. less than half of the continental mean. The Government, through its Ethiopian Roads Authority, ERA, has now planned for a major Road Sector Development Program, RSDP, to rehabilitate, upgrade and extend the road network.

The environmental impact of road construction work in Ethiopia is estimated to be significant. In particular, the topography of the country with mountainous landscape and sensitive soils carries a high risk of erosion. In the past, heavy rainfalls have also contributed to extensive erosion when volumes and speed of runoff water have become too high.

The forest cover of Ethiopia has over the last decades decreased substantially. Current estimates count a forest cover of less than 3% with about 6% of the remaining forest disappearing each year. Parts of this area are formally protected as national parks, hunting areas, and wildlife sanctuaries and reserves. Government and private entities have initiated programs for reforestation in some parts of the country although the extent of it is not accurately known. Impact on the natural environment is caused directly by the road construction work and related activities, but also indirectly by opening up of new areas for secondary development and settlement. It will be crucial for the remaining biological diversity - flora, fauna and their natural habitats - to be carefully considered and protected, particularly in connection with the extension of the road network.

Thus, an overall Sector Environmental assessment of the RSDP is required to identify the environmental impact of the proposed extension of the road network and to ensure that the program activities will contribute to environmentally sound use of the land and its resources. In addition, Environmental Impact Assessments the subject matter of this TOR are needed for alternative types and levels of construction and rehabilitation/upgrading measures of each individual road component.

#### BACKGROUND

On the basis of ERA's in-house preparatory activities and the results of the Road Transport Sector Study, the Government formulated the RSDP covering the period 1997 to 2007. The program was submitted to a Donors Conference held in Addis Ababa end of January 1996. The Donors Conference was successful in that several donors pledged their support for the road program including IDA, the European Union, the Governments of Japan, Italy, the Netherlands,

Germany, Sweden, as well as the United Nations Development Program (UNDP). According to present indication, IDA is considering the financing of (a) the rehabilitation of the Modjo-Awash-Mille bitumen surfaced road; (b) the upgrading of the Alemgena-Hossaina-Sodo gravel road; (c) the upgrading of the Woldiya-Adigrat-Zalambessa gravel road, (d) the upgrading of the Debremarkos-Gondar gravel road; (e) the upgrading/rehabilitation of the Awash-Kulubi-Dire Dawa-Harar gravel/paved road.

The RSDP aims to enhance and expand the Ethiopian road network over a ten year period and involves both road rehabilitation and construction of new roads. Detailed design of the individual road components will be developed gradually over this period. Environmental Assessment of the Program is required according to national policies, regulations and guidelines as well as to regulations of the financing institutions. Thus, the Environmental Assessment will be designed to cover both the overall Program and each of the individual road components. It will therefore consist of two types of studies:

- ✦ *A road Sector Environmental Assessment focusing on the sector planning process with the policy, regulatory and institutional framework, and on environmental principles, standards and guidelines for road projects; and*
- ✦ *Site specific Environmental Assessments for each of the planned road components.*

## ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The EA should identify any regulations and guidelines which will govern the conduct of the assessment or specify the content of its report. They may include the following:

- ✦ *World Bank Operational Directive 4.01, "Environmental Assessment", and related guidelines such as Operational Policy 4.04, "Natural Habitats", and Operational Directive 4.30, "Involuntary Resettlement";*
- ✦ *National commitments as expressed in proclamation 9/95, which provides the mandate for the Environmental protection Authority;*
- ✦ *for the individual road components: principles and criteria being developed under the Sector EA for the Road Sector Development Program;*
- ✦ *environmental assessment regulations of any other financing organizations involved in the project.*

## OBJECTIVE OF THE CONSULTING SERVICES

### PART I: Sector Environmental Assessment

The overall objective of the Sector Environmental Assessment will be to ensure that in-country capacity, regulatory framework, principles and procedures are established and will serve as the basis for environmental assessments of all future individual road constructions being carried out under the Sector Program. More specifically, the purpose of the analysis will be to:

- ◆ *Identify the most critical, overall environmental issues for the road sector in Ethiopia;*
- ◆ *Assist the Government of Ethiopia in developing in-country capacity for environmental impact assessment of road sector projects by developing the policy/regulatory and institutional framework for Environmental Impact Assessment (EIA), as well as strengthening the EIA capacity in all institutions involved, i.e. in governmental road sector and environmental agencies and among national contractors;*
- ◆ *Define environmental principles for road development and specific environmental criteria to be incorporated into the process of selecting priority roads for the RSDP.*
- ◆ *Initiate the development of environmental guidelines for road projects in Ethiopia, covering environmental considerations in all stages of a road project from identification and selection of roads and alignments, through design and implementation to the monitoring and evaluation of results;*

### PART II: Road Specific Environmental Assessment

The objectives of the road specific Environmental Assessments will be to identify, quantify, to the extent possible, the likely negative and positive environmental impacts of the proposed road work as presently designed, and suggest and produce cost estimates regarding the required mitigating measures to be implemented to avoid these negative impacts. Detailed mitigation plans will be prepared for each individual road proposal at a suitable stage of the screening process. Main potential negative impacts could include:

- ◆ *soil erosion due to removal of vegetation and to disturbance of soil conditions and surface and ground water flows during construction work on the roads right of way and related activities on areas for borrow pits, quarries, access roads and facilities provided for workers;*

- ♦ *disturbance of natural habitats due to both construction work with related activities and to the fact that new areas might be opened up for new settlements causing secondary environmental impacts.*

Although involuntary resettlement caused for example by the roads right of way is not readily predictable, any such resettlement identified during a later stage of the preparation, would be covered under EA requirement, and would need the preparation of a specific resettlement plan.

These Terms of Reference have been prepared with the objective that the EAs will be completed, endorsed by the Government of Ethiopia and cleared by the Bank's regional environment team, before the date of departure of the appraisal mission, tentatively scheduled for May/June 1997.

## CONSULTANT'S LOCAL SUPPORT FACILITIES & RESOURCES

The Consultant shall carry out virtually all elements of the study while based in Ethiopia, excepting only that the finalization of the final report should incorporate the comments received regarding the draft final report, and the subsequent printing of the final report may, at the consultant's discretion, be conducted elsewhere.

The Consultant shall provide all staff, labor, offices, accommodation, furniture, equipment, stationary, transport, utilities and any other resources necessary for the execution of the services. Property of the Consultant and items procured by the Consultant for the execution of the Services shall remain the property of the Consultant on completion of the Services and shall not be handed over to ERA. The cost of providing all of the Consultant's resources and facilities shall be shown in the Consultant's Financial proposal and, if not shown, shall be deemed to be included. The contracting Authority will assist with necessary formalities for the consultant's stay in the country.

## LIASION WITH THE EMPLOYER

The Consultant shall maintain close liaison with a project coordinator to be designated by ERA, through whom all formal communications shall be channeled. A formal joint meeting shall be arranged by the Consultant at least once a month to facilitate monitoring of the study; with the Consultant also responsible for the formal minutes of such meetings.

## DURATION OF SERVICES

The EA for both the five trunk roads and sector is estimated to take 16 weeks including mobilization. The following work schedule benchmarks representing the latest acceptable dates for the phased implementation of the Services.

Week 0 : Effective Date of Contract (Date of signing the Contract).

Week 2 : Commencement of the services.

Week 6 : Inception Report shall be submitted.

Week 12 : Draft Final Report shall be submitted.

Week 14 : Presentation of Draft Documents at a workshop to be attended by ERA, IDA and other Government Institutions; and Consultant shall demobilize immediately thereafter.

Week 16 : Final Report shall be submitted, incorporating formal comments.

The detailed reporting requirements are presented as Appendix B.

## DOCUMENTS AND INFORMATION AVAILABLE

A single complete fair copy of the documents listed below will be provided by ERA to the Consultant, immediately upon mobilization of the Consultant, for the purpose of, and for the duration of the study.

- *The National Conservation Strategy, 1994.*
- *Ethiopian Forestry Action Program, 1994.*
- *Proclamation 4/95: Definition of powers and duties of the executive organs of the Federal Democratic Republic of Ethiopia: Ministry of Agriculture, mandate on conservation and utilization of forests and wildlife resources.*
- *Proclamation 9/95: Environmental Protection Authority, mandate on evaluation of environmental impacts.*
- *Draft of National Policy on Natural Resources and the Environment, 1996.*
- *Draft of Proclamation on management and protection of biodiversity resources, 1996.*

The Consultant's attention is also directed to the following data sources and relevant publications.

- *Environmental Assessment Sourcebook and related regulatory texts published by the World Bank Group, including Operational Directives and Policies mentioned under Environmental Assessment Requirements above.*
- *Road and the Environment: A Handbook, World Bank, 1994.*
- *Road Maintenance and the Environment, World Bank, 1994.*

- *The International Convention on Biological Diversity, 1992. Ratified by the Government of Ethiopia.*

## *SCOPE OF SERVICES - SECTOR ENVIRONMENTAL ASSESSMENT*

### *1. Environmental Scoping*

The initial stage of the Consultant's intervention shall be the scoping of the program's field of influence, activities and impacts that are to be studied in the Sector EA.

### *2. Description of the Proposed Sector Program*

Description of the proposed sector program shall be based on the RSDP document. It should cover the administrative framework with program planning and implementation procedures as well as the technical design, and be organized so that the environmental impacts of the work components will be easily identified.

### *3. Study Area and Baseline Data*

The Consultant shall describe and evaluate the current environmental situation of the country, taking account of recent reforestation activities, and include environmental information relevant to the sector program, with emphasis on those areas where individual road proposals are already developed. Any proposal involving roads leading towards and traversing national boundaries, for example towards Eritrea, should consider the environment on both sides of the border.

One of the most important issues is erosion, and this section should identify areas of special sensitivity to disturbance, such as areas with steep slopes and sensitive soils, as well as needs for soil conservation and revegetation. Water harvesting policies and design treatments shall also be specified. Of great concern is also the rapidly decreasing area and fragmentation of natural habitats and the need for protection. The Consultant shall identify areas of high priority for conservation of natural habitats, including formally protected areas such as national parks.

### *4. Policy and Regulatory Framework*

This section is to identify the country's policy base for environmental commitment in road sector activities, as well as the regulatory base for environmental assessment and accounting relevant to road sector activities. The Consultant shall analyze the existing environmental policies and legislation, including directives for environmental impact assessment, and assess needs for strengthening.

The Consultant shall also analyze sector-specific policies, laws and regulations that have environmental implications. The sectoral investment planning process, in terms of objectives, methodology and procedures for review and approval of plans and projects, should be carefully reviewed. The EA should assess whether environmental and social issues are adequately covered by current procedures.

#### 5. *Institutional Framework*

Strengthening of institutions and building of capacity to assess and control the environmental impacts of the RSDP and its sub-projects will be essential. The EA will address institutional tasks and cover the project process from the initiation and review of EAs to the monitoring of the implementation of environmental mitigation plans.

ERA is responsible for the road network management at national level. In the past, ERA has held limited capacity to exercise a comprehensive environmental assessment of road projects. However, environmental considerations as identified through regular engineering practices have been addressed. Recently, ERA has assigned one of its engineers to study and address environmental impacts of its projects. The need for substantially enhanced in-house EA capacity is recognized, and the Sector EA should consider the possibility of establishing an environmental unit within ERA with the responsibility to conduct or supervise the environmental analyses of all individual road project proposals.

The Environmental Protection Authority, EPA, is given the overall responsibility for environmental impact assessments of the country's social and economic development activities. Ethiopia Wildlife Conservation Organization, EWCO, under the Ministry of Agriculture, is responsible for conservation of natural habitats and biodiversity resources, and the Environmental Planning Unit, EPU, under the Ministry of Economic Development and Cooperation, is involved in environmental planning at national level. The three institutions would all benefit from support to strengthen their capacities and control functions.

Finally, an important issue in Ethiopia is the division of responsibilities between the national and regional levels. The mandate for environmental assessment of regional road projects is not clearly defined, and should be addressed under the Sector EA. In conclusion, the institutional design and capacity and the distribution of responsibilities should be analyzed by the Consultant on both central and regional levels, in both environmental and sector institutions. Needs for additional fields of expertise should be assessed.

#### 6. *Analysis of Environmental Impact Issues for the Road Sector*

This section is to identify and assess the major environmental issues of the road sector, such as erosion, hydrological conditions/drainage, rehabilitation of borrow pits and quarries, secondary development when access to new areas are improved, new settlements, and disturbance of wildlife distribution. Special attention should be given to



cumulative effects, both direct and indirect, long-term and short-term. The Sector EA shall identify, for road projects in general, those potential environmental impacts which should be studied and assessed under each sub-project.

7. *Analysis of Alternatives*

The Sector EA shall consider alternatives based on the national transport system and policy and on the road sector policy. It shall further analyze the natural resource use, the types of roads planned and priorities for road resources to different regions.

Based on the analytical work carried out so far during the sector EA, the Consultant shall define environmental principles and criteria for road development under the sector program. These should be used together with technical, economic and social criteria to select priority roads for development under the sector program.

8. *Development of Management Plan to Mitigate Negative Impacts*

Emphasis shall be put on national and sector level mitigation. The first section of the plan shall address actions to be taken in response to the recommendations identified during the policy/regulatory/institutional analysis. It shall outline proposals for capacity building at institutional level.

A second section of the plan may take the form of a set of principles according to which the individual road components should be environmentally and socially assessed. The base for such principles may be found in the Government's Proclamations and other documents such as the National Conservation Strategy, but also in international conventions and agreements ratified by the Government. One example of a principle might be to avoid the alignment of new roads through critical and significant natural habitats such as national parks.

A third section of the plan concerns environmental guidelines. The Consultant shall provide information on existing environmental guidelines which are being followed by the road sector activities; identify needs for additional guiding material; and propose a plan for preparation of such guidelines.

The Consultant shall provide a budget proposal covering each step of the implementation of the environmental mitigation plan.

9. *Training Needs*

Based on the above analysis of institutional framework, the Consultant shall identify needs for environmental training within sector and environmental government institutions, private sector contractors and within concerned communities. Proposals for training programs for each group of stakeholders will be prepared.

#### 10. *Guidelines for Sub-Projects*

The Consultant shall identify environmental guidelines to be used in the individual road projects. Special needs for further generic and site specific guidelines shall be proposed. The country's own EIA material shall be used when available special recommendations with respect to collaboration with the European Commission on guideline preparation should be provided. The guidelines shall cover:

- *Environmental screening of sub-projects. Standards for categorization.*
- *Environmental assessment of sub-projects.*
- *Design of environmental mitigation plan.*
  
- *Monitoring of sub-projects.*

In addition, the Consultant shall identify standard operational procedures and conditions for inclusion in road construction contracts.

#### 11. *Environmental Monitoring Plan for the Sector Program*

The Consultant shall identify environmental performance indicators for monitoring of program implementation, and prepare a monitoring plan including the expertise required for continued supervision of the program, and the estimated costs during program implementation.

#### 12. *Public Consultation*

Public consultation is an integral part of the EA process. Since the Sector EA is conducted before most of the sub-project decisions are made, the Consultant shall conduct public consultation with various agencies, people including national NGOs, scientific experts, relevant government agencies and the private sector.

### *SCOPE OF SERVICES - ROAD SPECIFIC*

#### *Tasks*

A road specific EA should be carried out in connection with the preparation of each of the 5 individual roads proposed for IDA funding consideration under the Sector Program; for which the consultant will carry out comprehensive environmental impact assessments. Particular emphasis will be put on conservation interests (erosion/land slips, drainage channels, scour controls and water harvesting, loss of rare and endemic species, opening and subsequent site restoration of sources of material and plant and construction camp installations, etc.) and the dislocation of existing settlements. The consultant shall prepare environmental mitigation plans for each of the five road proposals. Further details are presented below.

### *1. Environmental Scoping*

The initial stage of consultant's intervention shall be the scoping of the area of influence, activities and impacts that are to be studied in the EA of each individual road. It shall comprise all the tasks that are required for an environmental assessment, as they are described hereafter. The Consultant shall start the assignment by deciding upon the limits of the study area for each of the five roads and drawing the list of activities and impacts to be studied during the assessment.

### *2. Description of the Proposed Road Improvements*

Description of the road improvement work shall be based on the proposals as they currently stand. It will take stock of the different components and break them down according to the type of works in order to ease the identification of their likely environmental impacts. A convenient way to do so is to break down each activity into the following phases; design, construction, maintenance and operation.

### *3. Study Area*

The study area shall comprise the road corridors and all surrounding areas that will be under significant influence, i.e., where the environmental impacts of the roads can be felt. The precise boundaries of the study area shall be determined during the initial scoping exercise of the EA.

### *4. Description of the Environment*

The consultant shall assemble, evaluate and present baseline data on the relevant environmental characteristics of the study area. It shall be a compilation of existing data and studies on the physical and socio-economic environment. These shall include information on any changes anticipated before the project commences. The following elements will be surveyed:

Physical environment: geology; topography; soils; climate and meteorology; surface and ground water hydrology and quality upstream and downstream.

Biological environment: flora; fauna; rare or endangered species; significant natural sites and sensitive habitats including parks and preserves, etc.; species of commercial importance (e.g. the World Bank project on medical plants); and species with potential to become a nuisance, vectors or dangerous.

Socio-economic environment: Land use; land tenure; human settlements; present water supply and water uses; control over allocation of resource use rights; patterns of new settlements; transport patterns.

### *5. Policy, Legal and Administrative Framework*

The Consultant shall draw attention to those regulations identified under the so far which will need to be applied in respect of the 5 roads proposed for IDA financing consideration.

6. *Determination of the Potential Impacts of and Impacts on the Proposed Roads*

Potential impacts to be assessed shall include, but not be limited to:

- (a) Project location: possible resettlement of people; change of property values; loss of forest and agricultural land; loss of vegetative cover; deterioration or loss of ecologically sensitive areas; impact on flora and fauna; impact on historic and cultural sites; effects on water resources outside and inside command area; induced development; need for water harvesting.
- (b) Project design: modification or disruption of natural drainage patterns; changes in groundwater elevation; design of road alignments and pavements as well as bridges and culverts; interference with movements of wildlife, livestock and local people; road crossings for people and animals; and water harvesting.
- (c) Construction works: landslides, erosions, stream and lake sedimentation; water logging at borrow pits and quarries; construction spoils; air pollution; noise; fuel and oil spills; sanitary conditions and health risks associated with construction camps and workers coming into the area; social conflicts between imported workers and local people.
- (d) Project operation: road spills and road runoff pollution; roadside waste; air pollution; noise; traffic safety issues.

The scoping part of the EA shall determine the exact list of impacts that should be investigated.

7. *Analysis of Alternatives to the Proposed Roads and Road Alignments*

The Consultant shall describe alternatives to the proposed roads and alignments. The concept of alternatives extend to location, design, technology selection, construction techniques and phasing, and operating procedures. The different impacts described should indicate which are irreversible or unavoidable and which can be mitigated. The analysis should address, to the extent possible, costs and benefits of each alternative, and incorporate the estimated costs of any associated mitigating measures. The alternative of keeping the current status without road improvements should be included for comparison.

8. *Development of Management Plan to Mitigate Negative Impacts*

The mitigation plan shall recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. The Consultant shall estimate the impacts and costs of these measures, and of the institutional and training requirements to implement them. Compensation to affected parties for impacts which cannot be mitigated should be considered. The Consultant should prepare a short and concise management plan including proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures.

9. *Identification of Institutional Needs to Implement Environmental Assessment Recommendations*

The institutional framework is to be addressed under the Road Sector EA. However, for each road proposal, a rapid review of authority and capability particularly at local and regional level shall be reiterated to ensure that the management and monitoring plans of the EA can be implemented. The recommendations may extend to agency functions, intersectoral arrangements, management procedures and training, staffing, budgeting and financial support.

10. *Environmental Monitoring Plan*

A detailed plan shall be prepared to monitor the implementation of mitigating measures and the impacts of the proposed road work during construction and after completion. The Consultant should define a few indicators of environmental performance that can be monitored on a regular basis.

11. *Assistance to Inter-Agency Coordination and Public/NGO Participation*

The EA work shall be carried out in close cooperation with ERA. The Consultant shall assist in coordinating the Environmental Assessment with other governmental agencies, notably the Environmental Protection Authority (EPA), Ethiopian Wildlife Conservation Organization (EWCO) and Environmental Planning Unit (EPU); and in communicating with and obtaining the views of local affected groups and NGOs, particularly in cases of new road alignments.

---

## APPENDIX B

### REPORTING REQUIREMENTS

The main EA report should focus on findings; conclusions and recommendations with specific proposals of action in accordance with the TOR. Detailed reports on the different technical subjects should be presented in appendices. The EA report shall be organized according to the following outline.

- *Executive summary*
- *Program description*
- *Baseline data*
- *Policy, legal and institutional framework for both environmental and road sector*
- *Environmental impacts*
- *Analysis of alternatives*
- *Mitigation plan*
- *Training needs*
- *Guidelines*
- *Environmental monitoring plan*
- *Public consultation.*

The Environmental Assessment report for each individual road proposal should focus on the findings, conclusions and recommendations of each of the tasks defined above, supported by summaries of the data collected and citations for any references used in interpreting those data. Emphasis shall be put on the Environmental Mitigation management Plan. Detailed baseline reports should be presented in appendices.

The EA report shall include sections on the following:

Executive summary; description of the proposed work; policy, legal and administrative framework; baseline data; significant environmental impacts; analysis of alternatives; mitigation management plan; environmental management and training; environmental monitoring plan.

The Consultant shall prepare the following documents for both studies.

#### INCEPTION REPORTS

Two weeks after completion of mobilization and six weeks after contract signature, the Consultant shall submit and present the inception report for the studies. The report is to outline the Consultant's initial findings and confirm the methodology and detailed work program proposed for adoption in the light of the initial findings; while also identifying constraints and proposed solutions, together with any action required by ERA to facilitate the successful implementation of the study.

proposed solutions, together with any action required by ERA to facilitate the successful implementation of the study.

**DRAFT FINAL REPORTS**

The Consultant shall submit and present the draft final reports for the study. The reports shall as far as possible be written to stand alone; without reference to other non-standard documents, and shall include but not necessarily be limited to: an executive summary concisely presenting key findings and recommendations; methodology; findings sections on each project element; and annexes-the latter to include: all key supporting documentation, data and printouts; key correspondence with ERA, minutes of meetings, etc.; comments received; and an annex detailing the consulting services, including details of: the staffing; the resources, facilities and utilities employed; the constraints; final costs and status of payments.

**FINAL REPORTS**

Within two weeks of receipt of formal comments regarding the draft final report, the Consultant shall submit the final reports for the studies which shall merely update the draft final report to incorporate the formal comments received. The reports shall include the comments and the Consultant's responses to them in the annexes.

**FORMAL MINUTES OF MEETINGS**

Throughout the project, the Consultant shall arrange formal monthly meetings with ERA's project coordinator; and shall take and circulate formal minutes of such meetings.

**SUBMISSION OF DOCUMENTS**

The Consultant shall submit the Inception Reports, the Draft Final Reports, the Final Report and the Minutes of Meetings as an original plus copies to both ERA and IDA, by hand or courier, in the numbers tabulated below and in accordance with the schedule stipulated herein. All reports shall be prepared in the English language.

	Recipients	
	ERA (No.)	IDA (No.)
Inception Report - Road Specific	3	3
Inception Report - Sector	6	3
Draft Final Report - Road Specific	10	3
“ “ “ - Sector	10	3
Final Report - Road Specific	10	3
“ “ - Sector	15	3
Minutes of Meetings of each Study	5	3
Final Report, diskette copies	3	3

<b>Postal Address</b>	<b>Ethiopian Roads Authority P.O.Box 1770 Addis Ababa Ethiopia</b>	<b>International Development Association (Div. AF2EI) 1818 H Street, NW Washington DC 20433</b>
<b>Telephone</b>	<b>(251-1) 156603</b>	
<b>Telefax</b>	<b>(251-1) 514866</b>	<b>(202) 473 8326</b>
<b>Telex</b>	<b>21180</b>	

**PC DISKETTE COPIES**

The Consultant shall submit with the Final Report 3 diskette copies of each document in Microsoft Word 6.0 or Word perfect 6.0 and Excel 6.0, unless otherwise agreed by the contracting agency and IDA. The diskettes shall be 3.5" and PC formatted.

The data files carried out using PC special programs or software if any shall be submitted with the final documents, with full supporting documentation.