REPUBLIC OF ALBANIA
MINISTRY OF CONSTRUCTION AND TOURISM
GENERAL ROAD DIRECTORATE

REHABILITATION AND IMPROVEMENT
OF ELBASAN - QAFE THANA (BORDER) ROAD

ENVIRONMENT IMPACT REPORT

prepared by:
S.I.A. INFRAPROJECT CONSULTING SH.p.K.
TIRANA - Rr. Sami Frasheri
Tel/Fax  0035542 - 28321

TIRANE, MARCH 1996
Preliminary Design
of Elbasan - Q. Thane (Border) road

Environmental Impact Report

March 1996
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<table>
<thead>
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<th>Acronym</th>
<th>Description</th>
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<tr>
<td>CEP</td>
<td>Committee on Environmental Protection (Albania)</td>
</tr>
<tr>
<td>IMC</td>
<td>Institute of Monuments of Culture</td>
</tr>
<tr>
<td>NRC</td>
<td>Italian National Research Council</td>
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<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>GRD</td>
<td>General Road Directorate of the Albanian Ministry of Construction and Tourism</td>
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<tr>
<td>MoH</td>
<td>Ministry of Health</td>
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<tr>
<td>MoI</td>
<td>Ministry of Interior</td>
</tr>
<tr>
<td>MoCT</td>
<td>Ministry of Construction and Tourism</td>
</tr>
<tr>
<td>OD</td>
<td>Operational Directive</td>
</tr>
<tr>
<td>PIU</td>
<td>Project Implementation Unit</td>
</tr>
<tr>
<td>ToR</td>
<td>Terms of Reference</td>
</tr>
<tr>
<td>WB</td>
<td>The World Bank</td>
</tr>
</tbody>
</table>
1. Executive summary

The present document presents findings for the mitigation measures of the Environmental Impact Assessment for the proposed rehabilitation of the Elbasan-Pogradec road located in the Republic of Albania, according to the ToR prepared by a WB staff and based on the Preliminary Design prepared by ICP.

The aim of EIA is to ensure that the competent Authorities give exhaustive consideration to the potentially negative and positive effects on the environment from implementation of the proposed infrastructures at an early and preventive stage, in order to support the decision-making process with the necessary information. The environment which will be affected by the so-called target environment, should be regarded in its natural, economic and cultural-social components, in order to have a holistic approach when addressing issues at stake.

The EIA also ensures that in case anticipated negative effects are unavoidable, ad hoc mitigation measures are proposed and implemented during construction of the infrastructure. In this context it is stressed that mitigation measures are an important component of design of the road schemes and are related to standards on road traffic, safety, environmental and economic terms.

The methodology adopted for carrying out the assessment consisted in field visits to the location of the road to collect data, followed by office work to refine findings and write the Report. Meetings with Albanian officials from GRD, the Ministry of Health, CEP, IMC and the ICP staff have played an important part in the work executed.

The present document is organised according to the ToR, starting with project description, the legal and institutional framework on the EIA context, the Albanian national environmental policy, baseline data on the study area, identification of potentially negative impacts, selected solution, mitigation plans, suggestions for environmental management training, environmental monitoring plan.
2. Project Description

The project concerns the rehabilitation and upgrading of the Elbasan - Qafe Thana (Border) section of the West - East Corridor TEM no. 8 to Macedonian and Greece.

This section starts at the intersection of the Tirana - Elbasan road with the Rrogozhine - Elbasan road, 100 m a.s.l. about 5 Km before Elbasan city, and following the narrow valley of the Shkumbini river, climbs to Thana Pass, 930 m a.s.l., where one branch proceeds through to Pogradec and Korça, to the Greek border, and the other to Macedonian Border, end of this project. Along the same alignment, up to Km 64, runs the railway Elbasan - Pogradec.

It aims at upgrading the existing road conditions, with limited realignments in critical points in view of the anticipated traffic increase from the present 2000 vehicles/day, 50% of which commercial, to about 5500 veh./day. Average travel speed is planned to increase from the present 15-20 km/h for trucks and 25-30 km/h for cars (according to weather conditions) to 45-50 km/h for trucks and 60-70 km/h for cars.

The following are the main data of the project:

- Length of road section: 72.1 km
- Road Cross-section: 2 x 3.75 m asphalt paved + 2 x 1.5 gravel shoulders in flat or gently rolling terrain (V≥ 80 km/h); 2 x 3.50 m asphalt paved + 2 x 1.25 gravel shoulders in mountainous section (V≥ 60 km/h); trucks climbing lane 3 m wide between Km 64.03 and 69.70 (Qafe Thana U-turns).
- Longitudinal slope: max. 8%; absolute max: 9% (three sections for 1300 m in total); gradient ≤ 1% = 28% of the total length
- railway over and underpasses: no. 11
- intersection with secondary roads: no. 10
- 22 bridges ≥ 10 m, plus 11 under constructions (previous WB financing)
- Planimetric trend: winding
- General orientation: WSW-ENE

More comprehensive details are provided in Technical Report prepared by ICP, together with climate and hydrological conditions, geological and stability conditions, structures, road safety works and signs and cost estimate.

Only minor expropriation action are foreseen, beeing the widening of the existing road along mainly governmental and municipal properties.
3. National Environmental Policy, legal and administrative framework current in Albania and in conformity to which the EIA was prepared

The Albanian national policy for protection of the environment has been increasingly directed at finding the proper measures to tackle the problem. To this end the Committee for Environmental Protection (CEP) was created. The Committee comes within the Ministry of Health & Environmental Protection. The Committee's headquarters is within the Ministry of Health, with branches located in the capital towns of each national district (see Article 4 Chapter 2 of Law No 7664 of January 1993). One of these branches is located at Elbasan. It is planned to strengthen the CEP in the near future so as to enhance its role in proposing and enforcing measures aimed at environmental protection.

Although at present laws on specific matters of the environment have not been enacted yet, the main reference in this regard can be represented by Law No 7664 dated 21 January 1993 (hereinafter referred as the Law), enclosed as Annex II to the present document. The Law refers to general clauses (Chapter I), EIA (Chapter 2). With regard to the latter it is to be noted that the present document points out that the Law identifies CEP as the Authority empowered to require environmental impact assessments in accordance with that Law for this type of intervention. However, the MoH is the authority responsible for establishing the procedures regarding EIA activities and the activities of individuals or legal entities. Chapter III deals with the licenses to be issued for activities that affect the environment, and a specific list of said activities is presented. The Law then comprises Chapter IV (inspections of and information for the environmental situation), Chapter V (duties and rights of central and local institutions on environmental protection), Chapter VI (responsibilities and related sanctions), and Chapter VII reporting final provisions.

However, it should be noted that the MoH from time to time issues documents of various nature such as guidelines, provisions and regulations which also affect the activities of CEP. For this reason a complete review of relevant legislation is not possible, even if it is believed that the Law can be taken as a benchmark.

Another law which is adopted in the execution of the EIA is the Law on expropriation, required whenever any strip of land has to be expropriated for public purposes. Law No 7848 dated 25 July 1994 and closed as Annex III to the present document. For the purposes of this document the main provision is represented by the right to appeal for citizens (Chapter V) against the expropriation of land. Here the owner of immovable properties has the right to appeal to the district court within 60 days from the date of receiving notification (Articles 22 and 23). Following this, three experts are nominated for the appraisal of the property and the amount due for compensation, and the deadline for presenting the appraisal of the property to be expropriated is fixed. Two of the experts are nominated by the court and one by the owner of the land.

Chapter V is the section of the law to which reference is made in case portions of land are expropriated for the construction of the road. Chapter VI is section of relevant interest in our case as it addresses the temporary use of immovable property, which may be the case during the execution of the envisaged works.

The legal framework is completed by Law No 7968 dated 15 April 1993, which addresses the restitution of land and compensation measures in the event portions of land have been or will be expropriated. It is enclosed as Annex IV to the present document.
4. Baseline data: assessment of the study area including description of the relevant physical, biological and socio-economic conditions.

This paragraph outlines the existing information according to the request of TORs.

4.1 Physical environment

The road passes in the Shkumbin river valley. On its way, the road passes different geological formations that vary from Quaternary alluvial sediments to siliceous and carbonatic sediments from Neogenic Flysh to Trias and metamorphic rocks. The geological conditions report and the climatic and hydrological conditions of the road are reported in the Technical report prepared by ICP.

4.2 Biological environment

The road to be implemented passes through a segment of river valley that despite human presence has conserved a good degree of biodiversity in the remaining natural environments. It is worth mentioning that while upstream of Elbasan in the Shkumbini river there have been identified 12 fish species, immediately downstream of it are present only 4. The Shkumbin river valley serves as geographical border for the distribution of some species but what is important in our case, it cuts through natural migration ways of big mammals like bear, wolf, jackal etc. At the same time, there is a consistent population of amphibians that use the water environment for breeding purposes on both sides of the valley.

Reclaimed area in the Domosdova field (Prrenjas field area Km 60 - 64) represent a high degree of human settlements for agricultural purposes therefore there is a scarcity of biological diversity, which is mostly represented by the common animal and vegetal species of scarce value.

4.3 Socio-economic conditions of the study area

The area is characterised by a marginal agricultural activities in the small alluvial fields on the flood plain with the exception of Domosdova field where agriculture is the main activity. Crops are represented by maize which is cultivated in farmed strips alternating to unfarmed strips and wheat in Domosdova area, whilst the rest of the land is left to extensive pasture for sheep and goats.

Additional economic activities are represented by a number of scattered shops selling goods of various nature. The area used to rely heavily for employment on mining activities that have stopped during the political changes. At the present there is a great degree of unemployment with an average income per capita that is amongst the lowest in Albania. The remaining part of the resident population is employed in economic activities in the towns of Elbasan, Librazhd and Prrenjas, comprising shops of various nature, workshops, etc.

Also the activity of the Steel Plant of Elbasan have been greatly reduced by the obsolescence of the processes in use.
5. Environmental Impacts: identification and assessment of both positive and negative impacts likely to result from the proposed project.

This section deals with the identification of potential impacts generated by the execution of project works. In the light of the context in which the present EIA has been executed, identification of impacts for soil, water, air quality, flora and fauna, noise pollution, land acquisition and resettlement, cultural heritage and road safety is presented in the following tables 5.1 to 5.8

<table>
<thead>
<tr>
<th>5.1 KIND OF IMPACTS ON THE SOIL</th>
<th>IDENTIFICATION OF IMPACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRESENCE</td>
</tr>
<tr>
<td>Soil erosion</td>
<td>X</td>
</tr>
<tr>
<td>Unstable slopes</td>
<td>X</td>
</tr>
<tr>
<td>Side-tipping of spoil material</td>
<td>X (2)</td>
</tr>
<tr>
<td>adjacent agricultural land</td>
<td></td>
</tr>
<tr>
<td>Soil contamination from runoff</td>
<td>X (3)</td>
</tr>
</tbody>
</table>

Key
(1) This in the case when top soil is utilised to create vegetation strips on the road slopes
(2) If inert portions of soils will be spoiled, as they are neither utilisable for creating vegetation strips nor for cultivation purposes they constitute a "waste" generating negative impacts
(3) This can be the case if water coming from the road surface is not collected in an appropriate drainage system

<table>
<thead>
<tr>
<th>5.2 KIND OF IMPACTS ON WATER</th>
<th>IDENTIFICATION OF IMPACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRESENCE</td>
</tr>
<tr>
<td>Water pollution from lead, zinc, dust, accidental spillage and other substances</td>
<td>X (1)</td>
</tr>
<tr>
<td>Increases turbidity from stone crushing/gravelp stone extraction plants in the river head</td>
<td>X</td>
</tr>
<tr>
<td>Secondary impacts of polluted water to agricultural land, around water pollution and pollution of the Shikumbi river</td>
<td>X (2)</td>
</tr>
<tr>
<td>Modification of water drainage patterns</td>
<td>X (3)</td>
</tr>
</tbody>
</table>

Key
(1) The presence and or absence of lead and zinc depends upon the correct use of unleaded fuel and the maintenance of engines. The main pollutants produced by running vehicles are: solid particles (corrosion, metal, tyres, road surface), lead, cadmium and organic compounds (grease, lubricating oils, rubber, etc.) The effects are significant in streams at the points of emission (runoff discharge points) Accidental spillage could represent the most dangerous pollutants for water course The
presence of important river like Shkumbin places an important role in the protection of water quality and associated vegetal biota.

(2) The generation of this kind of pollution significantly depends upon the pouring of polluted waters from the road surface, upon the ground in turn reaching the ground water through percolation.

(3) Road interferes with the pattern of existing drainage and irrigation system only in Prrenjas.

<table>
<thead>
<tr>
<th>5.3 KIND OF IMPACTS FOR AIR QUALITY</th>
<th>IDENTIFICATION OF IMPACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRESENCE</td>
</tr>
<tr>
<td>Generation of dust</td>
<td>X (2)</td>
</tr>
<tr>
<td>Pollution from leaded gasoline lead</td>
<td>X (1)</td>
</tr>
<tr>
<td>aerosols</td>
<td></td>
</tr>
<tr>
<td>Emission of carbon monoxide and</td>
<td>X (1)</td>
</tr>
<tr>
<td>sulphur dioxide</td>
<td></td>
</tr>
</tbody>
</table>

Key
(1) Both impacts depend upon the use of leaded gasoline
(2) Dust is usually negligible for new paved road.

<table>
<thead>
<tr>
<th>5.4 KIND OF IMPACTS FOR FLORA AND FAUNA</th>
<th>IDENTIFICATION OF IMPACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRESENCE</td>
</tr>
<tr>
<td>Passing through virgin areas</td>
<td>X</td>
</tr>
<tr>
<td>Disruption/isolation of wildlife habitats</td>
<td>X</td>
</tr>
<tr>
<td>Interference with the natural migration routes of big mammals and amphibians</td>
<td>X</td>
</tr>
</tbody>
</table>

Key
(1) The presence of underpasses and frequent bridges can compensate this handicap. There are 7 bridges with a span of over 2m and 16 bridges with a span ≥ 2m in the road segment Zibraque-Ura Murasatit (km 18 5-26 2), where the main migration way is located.

<table>
<thead>
<tr>
<th>5.5 KIND OF IMPACTS FOR NOISE POLLUTION</th>
<th>IDENTIFICATION OF IMPACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRESENCE</td>
</tr>
<tr>
<td>Passing through populated areas</td>
<td>X</td>
</tr>
<tr>
<td>Noise from quarries, crushers and</td>
<td></td>
</tr>
<tr>
<td>asphalt-making plants</td>
<td>X (1)</td>
</tr>
</tbody>
</table>

Key
(1) The mentioned sources of impacts are located far away from the site of the road and villages. Furthermore, no scattered residential areas are present in the zone.

1 The negative effect of habitat disruption/isolation in the wildlife population is related to: (i) interference with the seasonal migration behaviour of wild populations due to food availability etc. and (ii) isolation of wild populations with the risk of "inbreeding" or consanguineous crossing that can result in loss of competitiveness and lowering of survival rates for the whole population for a certain species.
The occupation area of the road upgrading is estimated to be about 27 ha, but the surface lost for agriculture may be estimated approximately nil, excluding waterways, abandoned land and the service areas.

(1) There is only one interference with an old mosque along the existing by-pass of Elbasan.

(1) It can be caused to road users by the increase of the average travel speed.

(2) On the contrary, the wide use of guardrails in dangerous points and road signs and markings, will reduce the number of accidents.
6. Identification of alternatives: comparison of different alternatives in relation to the overall benefits of selecting the proposed route.

Alternative selection is an important component of EIA as it helps to identify the most appropriate solutions respecting the needs of both the target environment and the proposed development. In this way benefits from the implementation of developments can be maximised and potentially negative impacts can be prevented, or at least significantly mitigated at an early stage.

Alternatives have been compared amongst each other in the light of the above concepts. The choice of the selected alternative is supported by findings acquired during the field visit and information from the road and by reading project maps from Elbasan to Qafe e Thanes (Pogradeci). The design maps permit to include specific comments on the optimal alignment of the road.

The study of the road alignment identifies several "hot spots" with the related necessity to avoid to pass nearby or across the towns of Librazhd and Perrenjas. Therefore, the most appropriate alignment is represented by locating the road in areas with the lowest density of buildings, which in our case is: (i) building a fly over bridge serving as a new ring road for Librazhd (700m) (this variant is the most recommendable in comparison to variant 1 - Passing across Librazhd and Variant 2 - Passing through some residential area at the outskirts of the Librazhd town); and (ii) avoiding to destroy and/or resettle any dwellings in Perrenjas town. The compromise requiring the road to pass nearby a limited number of houses is the outcome of this choice, which is unavoidable due to the scattered pattern of houses in the area.

The selected upgrading solution improves enormously traffic flow conditions with the possibility to maintain constant travel speed, which means less accelerations and decelerations, in turn increasing the engine performance. Revolutions per Minute (RPM) of the engines would then be very close to the optimal 65% ratio; consequently, the "running engine time" would be reduced of at least 70% as the time to travel along the road would be reduced as so and unburned gas emissions will also be reduced of about one third. The following Table explains the reduction of the time required to travel along the road.

<table>
<thead>
<tr>
<th>Cars</th>
<th>Existing road</th>
<th>New road</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 km/h = 0.5 km/min</td>
<td>70 km/h = 1.18 km/min</td>
</tr>
<tr>
<td></td>
<td>72 km = 0.5 km/min = 144 min</td>
<td>72 km = 1.2 km/min = 64 min</td>
</tr>
<tr>
<td>Trucks</td>
<td>18 km/h = 0.3 km/min</td>
<td>50 km/h = 0.83 km/min</td>
</tr>
<tr>
<td></td>
<td>72 km = 0.3 km/min = 240 min</td>
<td>123 km = 0.83 km/min = 87 min</td>
</tr>
</tbody>
</table>
7. Mitigation plan: identification of effective measures to reduce potentially adverse environmental impacts including costing, institutional training and monitoring requirements for these measures.

Mitigation measures are directed at reducing the impacts generated by the construction and related operations. In this case a set of mitigation measures is proposed in relation to each kind of impact as identified in paragraph 5.

7.1. Mitigation measures against impacts on soil. (Table to 5.1)

Soil erosion can be mitigated by planting native vegetation (shrubs and grass) on embankment slopes using top soil taken from excavations. This also avoids the spoil of top soil which can be re-utilised. It is recommended that other erosion controlling techniques like riprap covering and soil compacting techniques are parallelly used in order to compensate for high grazing pressure (mainly goats) in the initial stages. The slope of the embankments and the use of granular materials provide also good conditions for regrowth of vegetation.

7.2. Mitigation measures against impacts on water. (Table to 5.2)

Water from the road surface is collected by the drainage systems and the speed of polluted water can be reduced and infiltration rate increased by turfing the embankment slopes. Water drainage patterns in reclaimed areas should not be modified in order to avoid the contact between polluted and irrigation water. For this purpose on both sides of the embankment the drainage canals will be maintained and/or completed at lower elevation than the adjacent irrigation canals (Labinot Fushë & Domestova field).

Concerning the Shkumbin river, provisions should be made to protect the rivers waters from being the direct recipient of polluted runoff, collecting the pavement waters of major bridges into side pipes which finally will be dispersed into infiltration pits. The main bridges should have closed drainage systems that end up in infiltration ditches on both sides of the road or are connected to the side pipes. Due to the immediate vicinity of the river waters with the road embankment for more than 40 km there is a great concern for pollution from accidental spillage due to road accidents. For this reason it is necessary that the road has side pipes which end up periodically in some oil separator facilities. Planting of native trees, shrub and herbaceous crops would represent a further valid measure to benefit the biotic potential and better harmonise the road with the surrounding landscape.

Concerning the water pollution during the construction phase caused by the stone crushing gravel extraction plants provisions should be made that process waters (water used for washing the gravel) have to pass through precipitation ponds before entering the main water course of the river.
7.3. Mitigation measures against impacts on air quality. (Table 5.3)

Mitigation measures for air pollution control can be achieved cheaply by implementing vegetation screens to filter air pollution, with positive effects also for noise pollution. To prevent the generation of part of air pollution is envisaged the use of unleaded gasoline and proper engine maintenance, which also improves vehicle efficiency.

During the works it is important to try to avoid the generation of dust due to quarries and asphalt plants activity. However, in the case of the present road, since the majority of construction materials come from existing quarries located outside the project area the possible impacts are very limited and can be avoided with the use of bag houses, mechanical cyclones, etc., as prescribed in the requirements for new concrete and asphalt plants.

The road in its greater part is far from most of inhabited areas and sensitive receptors closer than 100m. The most critical point is the sector of the road passing across the Prenjas and Labinot plain where the vicinity with apartment flats and houses is less than 100m. Nevertheless, the area is also rather windy, this means that the atmosphere can be easily self-cleaned attaching limited importance to this item.

7.4. Mitigation measures against impacts on flora and fauna. (Table 5.4)

From the project design, underpasses connecting both sides of the road are scheduled on average 1 every 2 km in correspondence of bridges. At the same time the project foresees 2-3 drainage pipelines of 0.1-2 m every 1 km. Although the communication ways (bridges and drainage pipelines) normally coincide with small tributaries and hence are located in the preferential migrating routes this situation might be ameliorated by constructing further underpasses.

The trespassing of the road should be avoided in critical spots by fencing (for big mammals) and by the presence of drainage system located at each side of the road, which is another mitigation measure in place. In the km XX [3-4 km from Qafe e Bushi] close to Kuterman hunting reserve it is necessary that the area is fenced at least 100m on both sides of the small valley and proper wildlife warning signs are placed in the main road.

7.5. Mitigation measures against noise pollution. (Table 5.5)

Generally noise will be mitigated by the same vegetation screens adopted for air pollution. There are no settlements located near the road, except the crossed urban areas. In Prenjas and Labinot plains is foreseen to adopt wood and vegetal barriers against noise.

Since the road is not located near dwellings, impact mitigation measures will concern mainly the access of trucks to the work yards. The trucks traffic will increase during the construction works and the worst inconveniences are likely to occur during construction of the most critical sections like the ones constrained between the railway and the river, obliging to lower speed and consequent traffic slow down.
7.6. Mitigation measures against impacts on land expropriation. (Table 5.6)

Albania has no experience on expropriation of private land and related enforcement of compensation measures. Law No. 7609, current in force, should ensure that impacts derived from expropriations are mitigated and properly handled.

7.7. Mitigation measures against impacts on the cultural heritage and the landscape. (Table 5.7)

The cultural heritage is the product of human activity carried out through centuries and it may be the case that ruins and settlements of archaeological importance are present in the study area.

The present project does not affect the local heritage with the exception of the small mosque in the immediate vicinity of the Elbasan. Due to the vicinity of the railroad restricting the widening of the road this case has to be dealt with special attention. It is recommended that the road is diverted and special attention should be given to negative effect due to vibration during the construction phase.

From the landscape point of view mitigation measures for high embankments will be provided, through the planting of native trees, shrubs and herbaceous plants. The provision of extensive tree plantations in suitable areas on the river sides is also important.

7.8. Mitigation measures against impacts on road safety. (Table 5.8)

The road generally avoids to cross intensely inhabited areas and the road safety refers mainly to the road users themselves. In this case appropriate road traffic signs, marking and road intersections layout, road barriers are the most appropriate measures to be enforced. Setting up of speed limits and related patrolling from the Police service is another effective tool.

An important point the authority is called to define for the safety of road users is to discourage the crossing of the road by farmers with tractors and, above all, by animal-drawn carts domestic animals and pedestrians in the lowest sections.
Training is an important component of EIA, being a valuable updating tool particularly in the Albanian context. Through effective training it is possible to develop ad hoc expertise necessary to prevent and or mitigate adverse environmental consequences from roads, which can then be refined during the course of practical application of EIA to roads.

Although it is foreseen that CEP be the central authority dealing with EIA matters in Albania, it is recommended that Unit to establish within GRD, to acquire specific expertise on environmental issues related to road design, construction and maintenance. This reply on the one hand to the need to develop dedicated expertise, and on the other to have ongoing liaisoning between those responsible for road development and those responsible for environmental issues applied to road schemes.

A list of potential subjects to be dealt with in the training courses for EIA and road schemes is presented below:

- Available resources and the environment with elements for sustainable development
- The EIA process: general information and specific focus on roads
- Environmental management and conservation of natural areas with focus on the main biotopes present in Albania
- Principles of environmental economics
- Principles of biology
- Principles of geology
- Environmental pollution and environmental chemistry

The following is a list of elective courses:

- Latest impact assessment methods
- Cumulative impact analysis
- EIA at strategic level, policies, programmes and plans
- Environmental Health Impact Assessment
- Social Impact Assessment
- Principles of environmental monitoring
- Noise diffusion and barriers
- Vibrations
- Recent techniques to produce asphalt
- Leaded and unleaded gasoline
- Road safety
- Traffic management
9. **Environmental monitoring plan: specification on the type of monitoring, responsible agency.**

During the impact assessment stage events can be predicted with the aid of various technologies. After implementation of a road, the degree of reliability of assessment of the impacts will be evaluated by monitoring parameters utilised to assess each impact. Furthermore, monitoring allows to understand if impact assessment was reliable, if unforeseen events have occurred, regulations and laws have been complied with, and to anticipate trends of certain environmental parameters.

The GRD should not be responsible for monitoring environmental parameters for roads that GRD has designed and for which has been involved in the construction. Therefore it is advisable that a third party should be in charge for monitoring. This party can be identified in CEP as operational body under the supervision of MoH responsible for co-ordination of monitoring activities in the future.
10. Summary of mitigation measures

<table>
<thead>
<tr>
<th>IMPACTS</th>
<th>MITIGATION</th>
<th>DESIGN &amp; IMPLEMENT AGENCY</th>
<th>MONITORING AGENCY</th>
<th>MITIGATION COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil erosion</td>
<td>Planting vegetation</td>
<td>ICP &amp; CEP</td>
<td>CEP</td>
<td>50,000</td>
</tr>
<tr>
<td>Water pollution</td>
<td>Bridges drainage systems, embankment drainage canals</td>
<td>ICP &amp; CEP</td>
<td>CEP</td>
<td>600,000</td>
</tr>
<tr>
<td>Air pollution</td>
<td>Vegetation screens, unleaded gasoline</td>
<td>ICP &amp; CEP</td>
<td>CEP</td>
<td>17,000</td>
</tr>
<tr>
<td>Flora &amp; Fauna</td>
<td>Avoid animal road trespassing</td>
<td>ICP &amp; CEP</td>
<td>CEP</td>
<td>None</td>
</tr>
<tr>
<td>Noise pollution</td>
<td>Wood/vegetal barriers</td>
<td>ICP &amp; CEP</td>
<td>CEP</td>
<td>150,000</td>
</tr>
<tr>
<td>Land acquisition</td>
<td>Correct use of law</td>
<td>MoCT</td>
<td>MoCT</td>
<td>None</td>
</tr>
<tr>
<td>Damage to cultural heritage</td>
<td>None</td>
<td>none</td>
<td>IMC CEP</td>
<td>None</td>
</tr>
<tr>
<td>Traffic and workers accidents</td>
<td>Speed limits, police patrolling</td>
<td>Mol</td>
<td>Mol</td>
<td></td>
</tr>
</tbody>
</table>

11. Conclusions

The considerations presented above indicate that no significant environmental impacts will be generated by the construction of the Elbasan - Q. Thana (Border) road and also indicate that great benefits will be derived concerning work opportunities and improvement of the social conditions of the resident population.

Positive evaluations can be the attained on condition that road works and subsequent maintenance are carried out according to the parameters and suggestions provided in paragraph 7 with particular emphasis on avoidance of pollution of Shkumbini river.
ANNEX I

Terms of Reference for the Execution of the EIA

Prepared by WB Staff
ANNEX II

Law No. 7644 dated 21 January 1993

for

Environmental Protection
ANNEX III

Law No. 7848 dated 25 July 1994

for

Expropriation for Public Purposes and Temporary Use of Immovable Property
ANNEX IV

Law No. 7698 dated 15 April 1993

for

Restitution and Compensating
Former Owner Property