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REPUBLIC OF CAMEROON

CAMEROON-NIGERIA
TRANSPORT FACILITATION PROGRAMME ON THE BAMENDA-
MAMFE-EKOK-MFUM-OGOJA JUNCTION- ABAKALIKI-ENUGU
CORRIDOR

SUMMARY OF THE ENVIRONMENTAL AND
SOCIAL IMPACT ASSESSMENT ON THE BAMENDA-MAMFE-EKOK
SECTION ON THE CAMEROONIAN SIDE

DEPARTMENT OF INFRASTRUCTURE (OINF)       June 2007
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1. **INTRODUCTION**

1.1 This program concerns transport facilitation on the Bamenda-Mamfe-Ekok section of NR6, which the Government of the Republic of Cameroon intends to build with the financial support of the African Development Bank. At the sectoral level, the program aims to contribute to increased trade and co-operation between CEMAC zone countries and those of the ECOWAS zone in general, and between Cameroon and Nigeria in particular. The specific objective of the program is to improve the effectiveness of the transport logistic chain along the Bamenda-Enugu corridor.

1.2 At the environmental level, the program is classified in category 1, taking into account the type of work to be undertaken (asphalting of an earth road), its scope and the potential direct and indirect impacts which it may generate. In conformity with the requirements of the Environmental policy of the Bank and that of Cameroon, and with environmental requirements and laws, an environmental and social impact assessment (ESIA) is necessary. For each section, on the Cameroonian as well as the Nigerian side, an environmental and social impact assessment (ESIA) has been conducted.

1.3 The goal of the ESIA is to identify the potential risks on the physical, biological and socio-economic environments and thereafter, to put forward measures likely to offset or mitigate any negative environmental impacts of the project. This report is a summary of the ESIA of the program. The aforementioned study was made available to the public by the Ministry of the Environment and Protection of Nature (MINEPN), for information and comment.

2. **PROGRAM DESCRIPTION AND RATIONALE**

2.1 The components of the envisaged program are summarized below:

A. IMPROVEMENT AND/OR STRENGTHENING OF THE ROADS OF THE CORRIDOR

A.1 Periodic maintenance of the Bamenda-Batibo (42 km) and Bachuo Akagbe – Mamfe (21 km) sections in Cameroon, and the Ikom-Ogoja Junction (50 km) section in Nigeria;

A.2 Widening to 7.3 m (with standardized shoulders), strengthening of the Mfum-Ikom section (25 km);

A.3 Improvement of the Batibo-Numba (20 km) and Mamfe-Ekok (70 km) sections (with standardized shoulders) in Cameroon and reconstruction of the Ogoja Junction – Abakaliki section (85 km) (with standardized shoulders) in Nigeria;

A.4 Construction of a 100-m two-lane bridge over the Munaya in Cameroon and a 230-m two-lane bridge over the Cross River at the boundary between the two countries;

A.5 Dual carriageway on the Abakaliki-Enugu section in Nigeria (80 km);
A.6 Environmental impact mitigating measures;

A.7 Sensitization to HIV/AIDS, malaria and road safety, etc;

A.8 Work inspection and supervision.

B. RELATED WORKS

B.1 Improvement of connecting earth roads in Cameroon;

B.2 Rehabilitation of social and commercial infrastructures in the two countries;

B.3 Provision of agricultural produce drying yards in the villages around work zones;

B.4 Provision of boreholes and rest areas for drivers along the corridor;

B.5 Work inspection and supervision.

C. TRANSPORT AND TRANSIT FACILITATION ACTIONS AND MEASURES

C.1 Studies on transport problems;

C.2 Technical studies on the one-stop border point;

C.3 Construction and equipment of the one-stop border point;

C.4 Supply and installation of axle-load scales along the corridor;

C.5 Inspection and supervision of the checkpoint works;

C.6 Training/seminars/field trips/sensitization to the transport corridor concept.

D. PROGRAM MANAGEMENT

D.1 Operation of the program Coordination at the level of the ADB-PMEU in Cameroon, the Project Monitoring Unit (PMU) in Nigeria, the Steering committee and the Joint Technical Committee;

D.2 Equipment of the PMEU and PMU;

D.3 Monitoring and Evaluation of the program impact;

D.4 Equipment for the Directorates of Roads and Transport of the two countries in charge of monitoring the program;

D.5 Financial and accounting audit.
2.2 On the basis of the possibilities of an ADF allowance for this program and the mobilization of other donors, the implementation of the program may be subdivided into the following three phases:

(a) **Phase 1** comprising: (i) the improvement of the Mamfe-Ekok road on the Cameroonian side; (ii) the reconstruction of the Ogoja Junction-Abakaliki section in Nigeria; (iii) the transport facilitation component; (iv) part of related works; and (v) the program management component.

(b) **Phase 2** comprising: (i) the construction of new bridges over the Munaya in Cameroon and the Cross River at the boundary between the two countries; (ii) improvement of the Batibo-Numba section and routine maintenance of the Bamenda-Batibo and Bachuo Akagbe-Mamfe sections in Cameroon; and (iii) rehabilitation/periodic maintenance of the Mfum-Ogoja-Junction section.

(c) **Phase 3** comprising the widening to 2x2 of the Abakaliki-Enugu section.

2.3 The environmental sub-components comprise: (i) actions and measures of mitigation of the negative environmental impacts; (ii) sensitization to environmental protection, road safety, prevention against HIV/AIDS, sexually transmitted infections and malaria; (iii) environmental and social impact assessment of the quarries likely to be worked; (iv) environmental work; (v) environmental control and monitoring; (vi) work inspection and monitoring; (vii) expropriations; (viii) related works.

2.4 The design features of the project of improvement of the two sections are as follows: (i) reference speed: 80 km/h in the zones outside localities; (ii) width of the roadway: 7 m; (iii) verges on both sides of the roadway: 2 X 1.5 m; and (iv) taking into account drainage ditches, the roadway widths are: 11.6 m in areas of soil fill and 12.6 m in areas of soil cut. The total width of the right of way depends on topography and in particular on the heights of the fills and cuts.

2.5 The roadway structure is defined as follows: (i) sub-base: soil-concrete or natural lateritic sand-gravel aggregate 25 cm thick, (ii) base course: 0/31.5 crusher-run aggregate 20 cm thick, and (iii) surface course: double-layered surface coating (single-layered on the verges). Volumes of crushed quarry materials may be estimated on the basis of the bill of quantities as follows: (i) base course in 0/31.5 crushed rock: 130 000 m$^3$ and (ii) borrow materials for the soil-concrete sub-base: 35 % of 160 000 m$^3$ or 60 000 m$^3$.

2.6 On the Mamfe-Ekok section: (i) the construction of a single-check point at the Cameroon-Nigeria border either in Ekok or at Mfum, on the Nigerian side is to be envisaged in addition to installation of a radio-communications system and of axle-load scales at approximately 5 km from Eyumedjock town and the improvement of: safety/security at the border (Ekok).
Program rationale

At the international level

2.7 As mentioned above, the sector concerned is part of the Mombassa - Lagos Trans-African Highway, defined by the "Economic Commission for Africa" as a priority highway for the development of international trade. The improvement of the Numba-Batibo section of NR6 is essential for linking up the country's hinterland (South-West and North-West Provinces) and the Mamfe-Ekok international section for trade between Cameroon and Nigeria.

2.8 Already at present and despite the great difficulties and risks of travelling on the present track (numerous quagmires notably on the Mamfe-Ekok section, numerous cliffs on the Numba section - Batibo), there is a significant level of goods transit through Ekok via Mamfe.

At the regional level

2.9 The area concerned by the road has potential resources in terms of cash crops (high demand from the population of Nigeria), forest and fish resources, mines, as well as tourist resources. The tapping of these resources and the development of the area are currently constrained notably by the poor travel conditions owing to the bad state of the present track.

2.10 On account of the extremely heavy rainfall in the zone (approx. 3 400 mm/year in the Mamfe area and 2 000 mm/year in the Batibo area), traffic is frequently slowed down by the rains, and even stopped for heavy trucks (rain gates) and, notably on the Mamfe-Ekok section, even for small vehicles which may sometimes wait several hours or days before setting out again for a distance which normally should be covered within 30 minutes to 1 hour at most. In the rainy season, quagmires are frequent, making travel extremely difficult and costly. These problems swell transport costs and seriously hinder the evacuation of the regional resources to the urban centres or to Nigeria. The transport cost per head for the Mamfe - Ekok trip (70 km at present), varies between CFAF 2000 and 3000 in the dry season, reaching CFAF 5000 in the rainy season (that is, about 9 months a year), and CFAF 15 000 by motor bike.

At the environmental and social levels

2.11 The development opportunities of the area severely hampered by the transport costs of local marketable produce. Access to schools, health centres and other local infrastructures is constrained by transport problems. Moreover, the area’s isolation is obviously a dissuasive factor for the establishment of the required health and education personnel.

2.12 Furthermore, the key negative environmental impacts generated by the present track (wildlife and wood poaching) already exist, while at the same time the population is unable to enjoy good travel conditions. Moreover, the difficulties of checking the aforementioned illegal activities are themselves exacerbated by transport problems. In the dry season, the present track is a major source of dust emission and thus constitutes a health hazard.
2.13 The importance of this highway is recognized in official planning in Cameroon. Indeed, it is not only classified as a national road (N6), but was included in the network defined as "priority" on the basis of economic and regional integration criteria (see PERFED II project documents).

3. **POLITICAL, LEGAL AND ADMINISTRATIVE FRAMEWORK**

3.1 The ESIA is based mainly on the following Acts: Act N° 94/01 of 20 January 1994 on regulations governing forestry, wildlife and fishery, Act N° 96/12 of 5 August 1996: Framework law on environmental management, Decrees Nos.95/531-PM of 23 August 1995 to lay down the conditions for implementing the forestry regulations, 99/818/PM of 9 November 1999 to lay down the conditions for setting up and operating establishments classified as dangerous, unhealthy and noxious and 2005/0577/PM of 23 February 2005 to lay down the conditions for conducting environmental impact assessments. These different instruments provide the general legal framework of environmental management and ESIA in Cameroon and their conditions of implementation. Besides the laws, are Decree N° 0009/MINEPN of 8 March 2005 to fix the various categories of operations subject to an environmental impact assessment; for the public works sector, it is Act N° 96/67 of 08 April 1996 on the protection of national roads as amended by the Act N° 98 of 14 July 1998, and Circular Letter No. 00908/MINTP/DR: Guidelines for taking into account environmental impacts in road maintenance, which are used as the sectoral framework for ESIs.

3.2 At the administrative level, at least ten government departments intervene in environmental management on a sectoral basis. Of those, five are directly involved in the management of the environment as concerns road works: the Ministry of the Environment and Protection of Nature (MINEPN); the Ministry of Public Works (MINTP); the Ministry of Forestry and Wildlife (MINFOF); the Ministry of Water Resources and Energy (MINEE); the Ministry of Industry, Mines and Technological Development (MINMIDT). The Ministry of the Environment and Protection of Nature (MINEPN), which was created in April 1992, is responsible for environmental resources planning and management. It relies on the Inter-ministerial Committee of the Environment (ICE), which is charged inter alia, with giving opinions on environmental and social studies. At the operational level, various programs have also been put in place, of which, the most important at present is the Forestry - Environment Sector Program (FESP).

3.3 Decree N° 2005/330 of 6 September 2005 organizes the Ministry of Public Works, which is the executing agency for this program. It currently comprises a Division for the Protection of roads and the road environment. This Division is charged with road right-of-way-related expropriation and incorporation measures, in conjunction with the other competent government services. This Division has five technical officers whose capacities were enhanced thanks to training financed by donors, of which ADF.

3.4 Besides the government departments, the public institutional framework is composed of decentralized structures including mainly: local authorities or councils, as well as grassroots or village communities; cross-cutting institutions comprising governmental policy implementation bodies. The major private institutions intervening in the environment are NGOs whose existence in the individual or collective form is governed by law N° 90/53 of 19 December 1990 on the freedom of association, village community associations, cooperatives, faith-based bodies and Green Parties.
3.5 All the States of the Central African sub-region, including Cameroon, are signatories to the different international agreements and Protocols concerning the environment, notably: International Convention to Combat Desertification; Convention on Biodiversity; Climate Change Convention; Statement of principles on forest conservation; United Nations Convention on the Law of the Sea including the regulations on the management of natural resources; Regional plan to fight against the degradation of the continent and to rehabilitate degraded zones; Vienna Convention for the Protection of the Ozone Layer; Montreal Protocol on Substances that Deplete the Ozone Layer.

4. DESCRIPTION OF THE PROGRAM ENVIRONMENT

4.1 The road works envisaged under this program concern the road sections linking the North-West Province to the South-West Province, in particular Momo and Manyu Divisions and serving the towns of Batibo, Widikum, Mamfe and Eyumedjock. These Provinces and sub-divisional headquarters constitute the immediate program area (IPA). The extended program area associated with the indirect program impacts and facilitation measures concerns firstly the two countries (Cameroon and Nigeria) and secondly, the other countries of CEMAC and ECOWAS.

Physical environment

4.2 This program belongs to two geo-ecological zones of Cameroon, namely: the monomodal forest zone for the Mamfe-Ekok section and the high plateau zone where the Numba-Bachuo Akagbe section is located. The monomodal forest zone is under the influence of the Cameroonian equatorial climate with two seasons composed of a long rainy season and a short dry season, with variable levels of high rainfall of between 2.000 mm and 4.500 mm per year. The average size rivers of the area belong to the Atlantic basins. The high plateau zone, which is under the influence of the Cameroonian montane climate, has a longer rainy season (2.000 mm per year).

4.3 Worth noting in the program area are: (i) forest management units (FMU) 11 001, 11 003 and 11 005 (former Ejhagam Forest Reserve) which is close to the Mamfe-Ekok section and, (ii) in Numba village, a place of worship close to River Ati and a sacred place at the market. These two sites are located on the right-of-way between Batibo and Bachuo Akagbe. The populations of this village agreed to move their fetishes elsewhere in the same village provided that the project provides them the means to organize the various ceremonies.

4.4 The chief phyto-geographical units between Batibo and Bachuo Akagbe belong to two major zones: the Guineo-Congolese zone and the Afro-montane zone according to the classification by Letouzey (1985): (i) the Guineo-Congolese zone especially along the Mamfe-Ekok section belongs to the evergreen tropical moist forest estate of the Biafran Atlantic district. Three facies types are found there, viz: - Biafran Atlantic Caesalpinioideae (Type 228) forests abounding in high-value species such as: Afxelia spp (Doussié), Brachystegia spp (Ekop), Distemonanthus benthamianus (Movingui), Erythrophleum ivorense (Tali), Lovoa trichilioides (Bibolo), Entandrophragma cylindricum (Sapeli), Terminalia ivorensis (Framiré) and Cedrella odorata etc and a very wide range of non-timber forest products (NTFP) or special products, the most important ones, from a social and economic viewpoint, being: Gnetum spp (Eru or Okok), Irvingia gabonensis (Andok or wild mango), Garcinia cola (Bitter kola) and especially Carpologia lutea (Radian or...
Tunistic or Candle stick) whose demand by Nigerian consumers is ever increasing, atlantic forests with rare Caesalpiniaeces, of North-Western type (Type 203 and Type 204), characterized by Caesalpiniaeces scarcity but also by the presence of coastal elements; (ii) the Afro-montane zone characterized by (a) markedly degraded facies of the montane forests (Type 117 and 119) of the classification by Letouzey (1985) and found notably in areas with high human concentration and particularly around Batibo and Widikum; (b) markedly degraded facies of evergreen forests (Type 208) which is the estate where anthropic activities have reached a very high level, notably along the roads and agglomerations, especially around Mamfe and Eyumojock where they are more pronounced. Species such as: *Alstonia boonei* (Emien), *Ceiba willi pentandra* (cotton tree), *Dracaena arboreus*, *Musanga cecropioides* (umbrella tree) are most common. *Chromonela odoratum* (Bokassa grass) is very widespread in the Ejagham area and around Mamfe. Here and there, are also virtually bare areas where the facies are dominated by species planted by man such as *Cocos will nucifera* (coconut) or *Elaeis guineensis* (oil palm). Apart from the agricultural species, the others are of very low economic value but sometimes have a significant social role. Despite the lack of recent data on the qualitative and quantitative inventory of local fauna, an analysis of previous studies suggests that the project area could be home to a significant wildlife potential.

### Population and poverty profile

4.5 The population of the program’s direct impact area is estimated at 211,035 inhabitants with a variable annual growth rate of between 2.9% and 3.7%. The average density is 33.4 inhabitants per km² in Mamfe subdivision, 19.57 inhabitants per km² in Eyumedjock subdivision, 184 inhabitants per km² in the Batibo subdivision and 60 inhabitants per km² in Widikum Menka subdivision.

4.6 The poor are: (i) Between Widikum and Bachuo Akagbe: women in polygamous marriages, disabled persons, mental patients and the very numerous epileptics found there. Nearly 60% of the population is poor. The youth (25 to 30 years) are most affected as nearly two-thirds of them each have two to three wives with 7 or even 9 dependent children, (iii) Manyu Division: The poor in order of numbers are: (i) child orphans, notably HIV/AIDS orphans; (ii) the disabled, (iii) people living with HIV/AIDS, (iv) the elderly and (v) street children (Mamfe town). These people cannot afford one square meal per day which in the zone is equivalent to CFAF 250. This category represents a little over 60% of the population of Manyu Division. Between 2005 and 2006, approximately 2767 orphans and vulnerable children were identified. This number is rising through the years. Peasant farmers are also affected by poverty: they are three times more likely to be poor compared to households headed by public servants or formal private sector workers.

### Production and marketing

4.7 Agriculture is the principal activity of the populations. Food crop farming is traditional and primarily for subsistence. Food production in the area is characterized by a wide range of crops, notably corn, colocassia, cocoyam, cassava, plantain, groundnuts, beans, yam, market gardening and fruit growing. It is practised on farms of 5 to 10 ha on average, divided up into several parcels of land and comprising: (i) a vegetable garden with medicinal plants, (ii) a cocoa or coffee farm (approximately 2.5 ha), (iii) a food crop farm of 1 to 2 ha where mixed-farming (banana, groundnuts, corn, cassava, yam) is practised and which is left fallow after 5 years of use, (iv) a palm plantation of 2 to 3 ha with selected seedlings and (v)
fallow lands of 2 to 10 years’ duration. There are also cash crops, the foremost being: arabica and robusta coffee (about 1 500 tonnes per year), cocoa (about 200 tonnes per year) and especially oil palm. They constitute the principal sources of income of the populations. Oil palm cultivation has witnessed a boom thanks to the activities of PAMOL Company in Ndian Division, which impacts palm oil and palm wine production and contributes to the socio-economic development of the area as a whole.

4.8 Stockbreeding is of the traditional and family type only and limited to small livestock (goats, sheep, pigs and poultry). The contribution of livestock to the local economy is insignificant, despite the diversity of the fauna and flora supported by the vegetation. Cattle breeding is practised in the Batibo area by a handful of Bororos (an indigenous and relatively marginalized minority ethnic group) who practise transhumance.

4.9 Mining production is not yet effective the project area. However, the existence of salt lakes is reported in several villages of Eyumedjock subdivision: the locality is rich, indeed extremely rich in salt lakes locally called "Kang", so much so that the village names ending in "kang" are the areas where these salt lakes are found. So far already, 4 salt lakes have been discovered at the following localities: Sanakang, Mbenyang, Bakang and Mgbejata. Also reported is the existence of precious stones and oil showings. In the sedimentary basin of Mamfe (between Mamfe and Akwaya North), showings of lead, zinc, sapphire, lignite and salt were discovered, as well as some thermal springs. There are also potentialities for the exploitation of building materials such as sand and gravel whose commercial exploitation is constrained by the bad state of roads.

4.10 The secondary sector in the immediate project area is poor. The main industry is that of industrial palm oil processing by MOPCOOP (Manyu Oil Palm Cooperative) with its oil mill at Nchang, and MAPKIN (Manyu Palm Kernel Industry) for the processing of palm nuts at Mamfe. There are also numerous motor or manual presses belonging to local private promoters and to community groupings. Handicraft is developed in the immediate project area with the intensive exploitation of cane.

4.11 In Mamfe, the reference production is the processing of cassava marketed on a large scale in the form of "gari" in and out of the South-West Province. Mamfe is also a major fruit (orange, papaya, mango, etc.) production centre and is at the crossroads of the transit of goods from Nigeria via Ekok over the Cross and Manyu Rivers and bound for the North-West, West and Littoral Provinces.

4.12 The marketing of coffee and cocoa is liberalized. Exporters buy from farmers directly or sometimes from co-operatives and fulfil customs formalities themselves or through intermediaries. Certain co-operatives buy from farmers and export directly.

4.13 The periodic markets include both weekly markets and seasonal markets. The former deal mainly with food products, while the latter deal with cash crops (cocoa, coffee, palm nuts). There are periodic markets in all the big villages crossed with permanent cores at Batibo, Widikum, Bachuo Akagbe, Mamfe, Eyumedjock and Ekok. Here, the marketplaces are more or less built up and conspicuous. In general, periodic market trade concerns two categories of products: manufactured goods and farm produce. The permanent markets are held everyday of the week in the chief towns of subdivisions. Foreign trade is dominated by manufactured goods from Nigeria. Quarterly customs receipts amount to about 60 million
per quarter in the dry season and fall to 5 million in rainy season owing to the bad roads which virtually bring activities to a standstill during this period.

4.14 Among the potential productive sectors of the immediate project area, tourism offers undeniable and under-exploited opportunities. The huge untapped tourist potential includes notably: (i) in Eyumedjock subdivision, historic sites such as “German place” called Abokeng german, which is located at Sanakang, of two German bridges, of which the Ekwen bridge built in 1935, which crosses the Monaya River, and the Cross River bridge at the Cameroon/ Nigeria border, many caves of which the Ottarem cave of and Abat cave, Lake Ejagham and the falls which can be harnessed for power generation; (ii) in Mamfe subdivision, the hanging bridge over the Manyu; (iii) in Widikum Menka subdivision, the falls located at Olorunti and Ichia village on the River Tandjo (Batanga) and the hanging bridge at Olorunti and Egbeotchub. In the extended project area, one may mention the national parks of Korup and Takamanda respectively to the south and the north of the Mamfe-Ekok section. There are accommodation facilities in the area: almost all the subdivisional headquarters and certain big villages such as Ekok have a hotel and/or an inn.

Gender

4.15 Besides gender relations, the gender aspect in the assessment study area also concerns inter-generational relations and relations between the Bororos and other indigenous ethnic groups. (i) In general, the man’s status prevails in his relationship with a woman. Despite being heavily involved in agricultural activities (food production) and in housework, women remain disadvantaged in the decision-making process and participation in public life. Indeed, 2/3 of the women are in polygamous marriages (largely exceeding the national rate of 1/3), particularly in Batibo and Widikum Menka subdivisions where this practice is commonplace. Their average age at first marriage is approximately 16 years in the project area, against 17.6 years for the whole country. Such early marriages at least partially account for the demographic structure which shows a population with a female majority of 50.6% against 49.4% for men. Among the married women in the study area, only those of Mamfe and Eyumedjock subdivisions take part in decision-making in the household and even in public life. However, in Batibo and Widikum Menka subdivisions, women’s emancipation is gathering momentum as the women are increasingly developing a spirit of self-reliance and are quite dynamic in their associations. Generally, it is men who inherit and manage land, as in the majority of the Provinces of Cameroon. However, in the Eyumedjock area, men as well as women can own land. The women are bound to farming and housework, and are in charge of all the agricultural tasks apart from clearing (slash and burn) and tilling. They are responsible for the palm oil production (second source of income) -related tasks. In this sector, the men are in charge of the upkeep of the palm plantations, harvesting and cooking of the palm fruits and the sale of oil, while the women strip the palm fruits from the bunches, trample the fruits and collect oil. The palm wine sector is controlled by men; women are however involved in its transportation and sale. Besides these activities, are the daily tasks related to children (care, education, etc), and household chores (cooking, cleaning, etc). The rural women generally have very limited access to the factors of production, be they physical factors (tools, inputs, etc.) or non-physical (credit, training, etc). For the latter factors, the isolation of the study area constitutes a major constraint; (ii) intergenerational relations remain based on mutual respect.

4.16 Elders are respected as custodians of wisdom. This was noted during focus groups organized to collect information from villagers: young people, although having a
relatively higher level of education, expressed their views to the Consultant only after approval by the old men of the group. Parents are increasingly transferring part of their properties to their major children who exploit them independently. This development in customs is contributing to maintain young people in the villages. Within their respective families, the children are in charge of fetching water for the household, fetching firewood and assisting their parents in farm work. In the Widikum area, such assistance is extremely significant and considerably affects the children’s schooling: indeed, the majority of the parents attach little importance to their children’s education. It is noted that the majority of children generally attend school on only three out of five days, particularly on Mondays, Tuesdays and Wednesdays; Thursdays and Fridays being devoted to helping their parents in farm work (palm oil production). During these two days, nearly 50% of pupils stay away from school.

4.17 The women and children of the villages crossed do not benefit from adequate vaccination coverage; this is due to the isolation of the project area which makes it difficult for the populations to access the numerous health facilities particularly in the health districts of Batibo, Widikum, Mamfe and of Eyumedjock. The most common diseases in the program area are: HIV/AIDS with a prevalence rate ranging from 5.3 to 8.7%. Other communicable diseases include chlamydia, syphilis and gonococcal disease. There are also reports of respiratory infections such as HIV/AIDS-related tuberculosis, bronchitis and rhinitis, malaria affecting 60 to 70% of the patients consulted, the presence of mental patients especially in Batibo subdivision, a high frequency of epileptics (Batibo and Widikum), cardiac diseases such as hypertension caused by diabetes, and tropical diseases such as onchocerciasis. In this part of the country, the mortality rates are absolutely alarming, for instance, more than one out of 7 children born in this area die before 5 years of age. The weak vaccination coverage rate noted, whereby less than 30% of the children receive all the vaccinations, would be one of the principal causes of this high rate of infant mortality. Moreover, the high rate of HIV/AIDS seroprevalence (5.33% to 8.7%) should also be among the causes of the excess mortality in the study area.

4.18 According to the Poverty Reduction Strategy Paper (PRSP), the Government is committed to taking measures: (i) to support women’s access to credit and to the factors of production and to promote women’s entrepreneurship, (ii) to eliminate prejudice and discrimination in girl child education and to promote the civic, economic, political, moral and legal education of women and girls, (iii) to sensitize the population in general, and women in particular, to the importance of a clean environment to health, and (iv) to improve women’s knowledge on family planning and to popularize education.

4.19 The promotion of gender equality and equity in all sectors of national life fosters gender mainstreaming in development programs and projects and strengthens the gender approach capacities of women’s advancement professionals. To that end, the authorities have developed a series of actions ranging from advocacy to the putting in place of a gender approach coordination mechanism in development activities, through the training of decision makers, planners, as well as personnel of the ministry in charge of women’s problems and the publication of a practical gender awareness manual, etc.

4.20 To ensure the strengthening of existing structures and institutional mechanisms, the government is (i) setting up an autonomous structure for data collection, centralization, analysis and dissemination and information on the situation of women, (ii) strengthening the capacities of field actors of women’s advancement and (iii) strengthening the capacities of
the decentralized or specialized structures of the ministry in charge of women’s problems, in particular women’s advancement centres and appropriate technology centres. To date, no major action has been undertaken in favour of women. However, some isolated activities have been undertaken notably by decentralized public services within the framework of poverty reduction. The women are encouraged to form associations in order to receive support in particular from HIPC funds. For the other disadvantaged groups, the social service of Manyu Division has put in place a policy which aims to: (i) encourage the disabled to be self-reliant by undertaking income-generating activities, (ii) sensitize the families concerned to accept vulnerable people as such, (iii) ensure the effective implementation of governmental action as regards education in particular concerning free primary education, in accordance with Law N° 83/13 of 21 July 1983 on the vulnerable persons program and also with Circular Letter N° 3406/06/LC/MINESEC/MINAS of 2 August 2006 relating to the admission of handicapped children and those born of poor handicapped parents in Government secondary schools as concerns exemption from school fees. The actions to support vulnerable persons include government support through HIPC funds, as in the case of the Mamfe social centre which in 2006, supported 27 legal and natural persons of all vulnerable groups put together, as against the 66 requests for assistance received.

5. PROJECT OPTIONS

Without project Option

5.1 To date, national road N°6 still comprises earth road sections that are permanently in a bad state and others that are well paved. Accordingly, its setting to international standards in a bid to facilitate transport and the transit entails substantial investments on the Bamenda-Mamfe- Ekok, sections, without which, achieving the Millennium Development Goals at the desired level in Cameroon in particular and in the sub-regions of Central and West Africa in general, will not be possible. The consequences generated by the option without project are inter alia: (i) the lack of traffic fluidity and the blockage of national, sub-regional and inter-regional integration; (ii) the worsening of poverty in the areas concerned and (iii) non-contribution to economic development through trade between Nigeria and Cameroon. Definitely, this option should be ruled out. The alternative “without project” is not in conformity with the economic and social development policies of Cameroon or donors, let alone with the principles of revival of socio-economic growth.

Option envisaged

5.2 The engineering design did not consider any alternative alignments or cross-sections for the roads (maintenance of the present alignment with correction of the deviations aimed at improving it). The alignment chosen best suits the present right-of-ways of crossed localities. The distance separating the roadway from houses generally allows for preservation of the road without having to move or demolish many structures. One can thus envisage preserving the present habitat structure to avoid disturbing the spatial layout of dwellings and gardens, despite widening the road. As with any road project, one other objective is obviously to develop the most cost-effective solution possible by taking into account the geometrical, geotechnical, hydrological, environmental, etc. constraints, as well as local availability of building materials. The improvement and asphalting of the existing road are the alternatives chosen for the Bamenda-Mamfe-Ekok program.
6. POTENTIAL IMPACTS AND MITIGATION AND OPTIMISATION MEASURES

Positive impacts

6.1 This road will generate numerous positive impacts, the most salient being: (i) improvement of the quality of life of locals, (ii) business opportunities for local companies which will be able to win subcontracts from the contractor during the project; (iii) jobs (1 500) for locals, in particular the youth who constitute 60% of the project area population (iv) increased demand for food, drinks, food products and manufactured consumer goods, housing and transport in the project area, (v) uninterrupted supplies for traders and evacuation of locally manufactured goods to consumption points, (vi) increased land value in the project area (vii) development of ecotourism notably around historic sites such as "German place " called Abokeng located at Sanakang, the two German bridges of which the Ekwen bridge which was built in 1935 over the Monaya River and the Cross River bridge at the Cameroon-Nigeria border, the caves of Ottarem and Abat, Lake Ejagham, the falls of which moreover can be harnessed for power production (the falls are located at Olorunbi and Ichia village on the Tandji River) and the hanging bridges of Olorunbi and Egbetchu; (viii) increased production and marketing of farm produce and handicrafts, driven by demand; (ix) facilitation of flow of agro-pastoral and handicraft products; (x) facilitation of emergency evacuations for health reasons from the villages to district hospitals of the area in terms of time and costs. For instance, travel time could drop from 2 hours or even several days to between 30 minutes and one hour. The same will apply to transport costs which will drop from between CFAF 2 000 and 15 000 to around CFAF 1 000 per head; (xi) better equipment and supply of the health centres in the project area; (xii) development of goods and passenger transport in the two directions, (xiii) the reduction of goods and passenger transport costs to approximately CFAF 1 000 against the CFAF 4 000 to 15.000 / per head currently paid between Mamfe and Eyumedjock or Batibo and Bachuo Akagbé, depending on whether one travels by car or motor bike; (xiv) better sub-regional integration; (xv) easier movement of development agents engaged in the promotion of women’s activities; (xvi) increased school enrolment of children and girls; (xvii) improved intervention capacities of NGOs and farmer organizations; (xviii) easier mobilization of the populations for the implementation of community projects; (xx) the intermingling of different cultures resulting in emancipation of locals (adoption and practice the modern lifestyles) and strengthening of national and sub-regional integration; (xxi) development of the values of tolerance and acceptance of differences (reduction of the phenomenon of identity assertion); and (xxii) more effective fight against wildlife and wood poaching. On the whole, the project will contribute to poverty reduction and the improvement of the living environment and conditions of the population.

6.2 Regarding gender, the women of the area, on the Cameroonian as well as the Nigerian side, are much engaged in income-generating activities. Many socio-economic activities are controlled by women (50.4% of the total population). Hence, the project will be beneficial to women, insofar as for all the women’s businesses generated (food sale, sale of local products in particular), it will fetch incomes for the owners and consequently for the women whose incomes could exceed CFAF 15 000 /month for the least productive. The children of the project area (43%), like many children in the country are affected by diarrheal diseases and other diseases due to the lack of hygiene and sanitation in the living environment. The project will also be beneficial to them thanks to the contribution of protein energy substances contained in vegetables and fruits from market-gardening activities and
especially from imports from outside the project area, thanks also to the attendant infrastructures which will be provided and the health checks which will be conducted on this segment of the population.

Negative impacts during the project

6.3 The Bamenda-Mamfe-Ekok sections cross several ecological zones such as forests and plains (between Mamfe and Ekok), shrub savannas, plateaux and hills (between km 0 and km 45), rivers the major ones of which are found between Mamfe and Ekok at km 33+298 and km 36+725 and between Batibo and Bachuo Akagbe at km 12+7 km 41+1 and km 62+85. These sections also cross farms, towns and villages. The environmental impacts will be significant but controllable through the implementation of appropriate mitigating measures and strict monitoring. During the implementation of works as well as during commissioning, the following negative impacts may appear.

Human environment

6.4 During the works, the dust and fumes generated on the construction site (clearing of the right-of-ways, construction work and bitumen preparation sites) may generate various harmful effects and respiratory diseases for roadside dwellers in crossed localities. In the work zones, noise from earthmovers and dynamiting may disturb the normally calm natural environment (borrow sites and quarries on the Mamfe-Ekok section: Km 3+4, km 10+5, km 10 to km 17, km 44+00, km 60+4, and project water collection sites). The noise will have harmful effects on work zone dwellers. Furthermore, in the urban areas (Batibo, Mamfe, Eyumodjock) and all the villages, the vibrations of earthmovers may undermine the stability of structures built of non-stabilized sun-dried bricks. However, many villages will be more or less spared.

6.5 The program envisages the expropriation of properties on the two sections as follows: 93 homes (belonging to 92 owners), the majority of which are of semi-permanent materials (non-stabilized sun-dried bricks, sheets, and thatch in some cases), on plots of an average of 88 m2. There are plots on national land left over from customary law: 108 sites recorded on 108 survey data sheets, to which should be added 322 identified crop owners with holdings of an average area of 0.5ha, none of whom was able to provide legal evidence of ownership of the land occupied, 3 community drinking water supply systems, one drinking water tower with accessories and 10 wells, nine of which are built. The costs of these compensations stand at CFAF 385 351 042, broken down as follows: total cost for crops, CFAF 196 558 315; total cost for buildings CFAF 178 982 727; total cost for 5 built graves, CFAF 1 150 000; total cost for 14 drinking water supply systems, CFAF 8 660 000. By adding 25% for contingencies (price contingency, identification of other properties to be expropriated during the project, etc.), the total cost of the expropriation is approximately CFAF 481 688 803. On this section, part of the compensations has been paid and the balance will be paid in the days ahead.

6.6 This displacement consists in shifting back 75 to 100 meters from the road right-of-way. In the program area, as the populations are attached to their homeland, they are unwilling to move. It is not therefore a question of mass displacement of several households from one place to another, but rather of individual, light and localised displacements of every household concerned. Furthermore, electricity and water supply disruptions may occur where the corresponding networks have not been displaced beforehand.
6.7 There is the risk of a rise in the prevalence rate of sexually transmitted infections (the STI/AIDS rate currently varies between 5.5 and 8%) due to the huge influx of project workers. There are possibilities of an upset of traditional ways of thinking and customs and practices during the project; project workers’ behaviours could upset local traditions and foster moral dissolution (prostitution, banditry, and drug addiction), misconduct (adultery) and undermining of the sovereignty of local populations.

6.8 Local traffic flow will be affected during the project, with temporary consequences on goods and services transport, higher risks of road accidents, direct transport costs and access to socio-educational and religious facilities. The problems of safety of users and locals created by the movement of the trucks and equipment, as well as accident risks involving cattle (quite rare at the moment) could rise.

6.9 During the project, uncontrolled disposal of worksite solid and liquid wastes (cut, sundry residues, waste generated by workers, etc.) could degrade the immediate living environment of the project site, as the discharge points may be transformed into wild dumps. This phenomenon will be particularly exacerbated during the earthworks which will generate substantial amounts of residue.

Natural environment

6.10 On the whole, the air quality and noise impacts will definitely be limited in both time and space. The scope of the emissions will in any case be very limited considering the extent of the area covered and the low level of emission of pollutants. This aspect is not therefore a decisive factor in the program, if basic prevention measures are taken.

6.11 Activities such as project site lay-out, opening of borrow pits and earthworks, the new provisional and final right-of-ways, movement of equipment outside these right-of-ways may generate negative impacts on soil structure and texture and create niches for vectors of diseases such as malaria, among others.

6.12 During surfacing, asphalting and road marking with paint, soil degradation and contamination effects could occur. Given the high rainfall, the risk of erosion of the slopes, the embankments and cuts or exposed areas will be higher, as long as a there is no pioneer vegetation to stabilize the soils. The risks of headwater erosion at discharge points of torrential rain water are also significant if such discharges are not carefully planned and if specific works are not provided to contain them. The impact of the road works on the soil will be moderate if certain measures are taken at the project design and implementation stages.

6.13 There are also potential risks of oil and hydrocarbons spillage during the works. Such unforeseeable accidents could be avoided if strict instructions are given to the drivers: compliance with safety speed limits and project site road signs.

6.14 The opening and the use of borrow sites (Km 3 + 4: near the Besongabang airport, close to the urban zone, Km 10 + 5: Eyanchang area; Km 10 to Km 17, Km 44 + 00: in the Eyumedjock area, Km 60 + 4: near Ekok), temporary deviations during construction of structures and bridges will definitely entail earthworks. Modification of topsoil properties (loss of fertility, indirect impact on crops, soil depth reduction, and modification of soil structure) could also occur during operations. These effects will be reversible in the medium-term if site restoration measures are taken.
6.15 The works scheduled could also generate the following effects: (i) deterioration of the quality of surface waters, notably Rivers Manyu at Nfaitok (Km 62 + 85) and Munaya (Km 33 + 298), and ground water through contamination by bituminous substances and hydrocarbon products; (ii) temporary deterioration of surface water through the entrainment of fine particles; (iii) modification of the natural water drainage systems (iv) possible disturbance of fresh water source heads and destruction of standpipes on the alignment.

6.16 Regarding the construction of new bridges, the environmental problems likely to arise would concern water pollution by left-over building materials and waste emanating from project works, movement of the trucks and the equipment transporting building materials, deviation/obstruction of the river, etc and as well industrial accidents. In addition, mud deposits extracted from the river to install the piles of the bridge will also have negative impacts on the soil, even if only the negative visible impacts and possible soil pollution.

6.17 During road works, water needs will be substantial (for the work site, for watering/compacting, etc). Most of this water should come from the numerous rivers in the area. Such collection of water could somewhat disturb the quality of these rivers, and thus reduce the amount of water available for the local populations.

**Biological environment**

6.18 Clearing or tree felling will be significant only where the future alignment deviates considerably from the present one: (i) on the Numba-Bachuo Akagbe section between Km 64 + 7 and Km 69 + 3; (ii) on the Mamfe- Ekok section between Km 36 + 725 at Km 40 Km 42 + 775 and between Km 45 + 525 and Km 53 + 650. All the alignments follow the initial ones, except at specific places for safety or technical/economic reasons. In case of the contrary, threats will notably concern some encroachments on forests belt, the destruction of some umbrella and fruit trees, cash crops, food crops and herbaceous and woody vegetation growing on the present road right-of-way and skirting it, constituting its principal landscape.

6.19 Other potential impacts during road works would concern: (i) poaching in FMUs 11 000, 11 003 and 11 005 which is likely to intensify owing to the presence of the project contractor’s workers; (ii) flight of animals from the noise generated by project equipment, etc. This impact is however limited in time and space. Gas and dust emissions resulting from the movement of equipment on the roads under construction or on the deviations, from machines and asphalt mixing plants will also generate impacts on the natural environment. Indeed, these emissions can affect the quality of ambient air, the dust and gas emissions settling on leaves and tree trunks, can obstruct plant photosynthesis. Such impacts will be particularly felt in farming areas.

**Potential impacts in operational phase**

6.20 The potential operational phase impacts will be: aggravation of finger erosion phenomena in the lowlands (in the rainy season) owing to the increase in paved surfaces. This phenomenon will be particularly pronounced in villages with very clayey soils located between Numba and Bachuo Akagbe.
6.21 Improvement of the quality of road sections will result in a higher frequency of traffic and movement. This could constitute factors of risk and potential accidents, not only for roadside dwellers and road users, but also for domestic animals and wildlife crossing the roads in protected areas, at FMUs 11 003 and 11 005 and population centres. Furthermore, the road improvement will bring about a foreseeable increase in heavy vehicles traffic, notably, vehicles transporting dangerous or hazardous substances, hydrocarbons, chemicals, organic pollutants, etc. that may constitute factors of environmental risk, in case of spillage.

6.22 Thanks to the quality of the highway which will henceforth be an all-season road, one can expect an influx of people from all walks of life for various activities: trading, sightseeing, hiking, holiday, etc. all of which could exert additional stress on the natural resources, cause socio-cultural disturbances and conflicts, undermine local customs and the harmony of customs and practices.

6.23 Increased vehicle and motorcycle traffic and speed will perpetuate sound nuisance around the animals and increase their mortalities. Collisions will occur with the slight increase in vehicle frequency. This negative impact will be permanent and will occur once the road is commissioned.

6.24 The forest belt of the program has been exploited, although it still contains substantial wildlife species. Population increase could further stress the fauna and flora. The new facilities could also lead to an influx of loggers into the area. There could be cut-and-run involving some high-value forest species found there. Furthermore, haphazard building along these sections cannot be ruled out. In this regard, the development of the area should be accompanied preferably by a corresponding forest assets protection effort. Involving the traditional authorities, sensitizing the populations to resource protection and strengthening control with adequate logistics are measures likely to deter anyone intending to engage in this illicit activity.

6.25 With the construction of the juxtaposed checkpoints at the borders, the commercial and social activities currently carried out at separate points (Ekok on the Cameroonian side and Ekom on the Nigerian side) will be concentrated in a single place (Ekok). Socio-cultural and economic problems could arise, owing to competition between operators, shady dealings, internal jealousy, dissolution of customs and practices and moral values, language differences, etc. In addition, haphazard building induced by this program could cause the irrational exploitation of available resources, which could exacerbate poverty in the areas.

Mitigative measures

During the construction phase

6.26 During the construction phase, mitigating measures will comprise: (i) before project start-up and during works, organization of information and sensitization campaigns among the technical services, the populations, traditional rulers, users, trade unions of haulers and the local communities on the problems concerning: safety, risks, hygiene, health (prevention of STI/AIDS) and protection of natural resources, cultural sites and monuments; (ii) before lay-out and installation of work camps and work sites, contractors will submit, for prior approval by the control mission, a work site lay-out plan, a quarry and borrow site working plan and an environmental impact mitigation plan, in accordance with the
environmental directives and the legislation in force in Cameroon; (iii) the installation of work camps around major centres (Mamfe and Batibo) such that these localities can own the facilities after project completion; (iv) recovery of oils, greases and lubricants in containers and their assignment to the local communities which often use such by-products in their day-to-day activities (treatment of wood against rodents, mixing with clay for house maintenance, treatment of lumber, etc.) (v) control of company vehicles and personnel (penalties); (vi) marking of high-value species by the forestry authorities (MINFOF) and salvage logging prior to project works; (vii) the creation of fine particle and hydrocarbons decanter/separators downstream of the machines and vehicles maintenance and cleaning areas; (viii) periodic drainage and clearing-out of these works; (ix) obligation to carry out all vehicle fuelling, maintenance and oil change operations at the site envisaged for this purpose; (x) recovery and evacuation of used oils and waste by the contractor; (xi) provision of latrines and pits for waste in the work camps; (xii) restoration of borrow sites by drainage, levelling and re-vegetation, where necessary; (xiii) regular watering of the roadway, earthwork areas and quarry slopes near dwellings, in case of excessive dust emissions (dry season); (xiv) mobile signposts, notably at night, in the work zones; (xv) preliminary identification and replacement of installations (public networks, taps, standpipes, generators) likely to suffer damage; (xvi) inspection of restoration of roadside residents’ access and the property affected by works; periodic health check-up of personnel; (xvii) constant supply of condoms on the local markets and in company personnel premises; (xviii) incentive to foster recruitment of locals during works and subcontracting to local companies (sand extraction, minor works); and (xix) obligation to carry out clearing and tree-felling using labour-intensive methods; prior to the works, sensitization of the prime beneficiaries of the project who are roadside dwellers and other stakeholders, through information and sensitization meetings on the project components; (xx) putting in place traffic signs at population centres (Batibo, Numba, Widikum, Bachuo Akagbe, Eyumedjock, Ekok, etc.), deviations and danger zones and speed limits (80 Km/h in open country and 40 Km/h in population centres).

6.27 To avoid potential negative impacts, care was taken to analyze possibilities of preventing the road from leading in the long term to faster degradation of natural resources of the area. An environment clause will be included in the tender documents (TD) of the works. Its main provisions will be designed to optimize protection of the environment and socio-economic activities: (i) local workforce recruitment mechanism; (ii) enforcement of labour and safety regulations for locals, users and project workers (protection equipment, gloves, helmets, dust masks, noise-proof helmets, extinguishers, etc.) (iii) site restoration and protection of natural resources (levelling and flattening on-site slopes, re-vegetation of the areas, planting of roadside trees, support to natural regeneration, sowing of local species and prohibition of grazing); (iv) the road right-of-way must be prepared following the same principles and the loss of species will be offset by the planting of roadside trees and the compensatory tree planting, notably on the Batibo-Bachuo Akagbe section especially from Km 0 to Km 45, under the supervision of the control mission and the decentralized services of MINFOF. In addition, the entrances and exits of towns and major villages will be decorated by planting suitable local tree species.

6.28 Fish, water resources and sensitive areas will be protected throughout the section such as to: (i) avoid creating artificial obstacles to wildlife movements; (ii) carry out dynamiting under the supervision of mining and forestry staff, and sequential explosions so as to minimize the vibrations and shock waves; (iii) apply bush fire and poaching prevention measures and techniques; (iv) prohibit bush meat hunting and consumption on the contractor’s work sites and camps; (v) sensitize to and control firewood use in the work
camp; (vi) prohibit the transportation of bush meat by project vehicles; (vii) respect the
customs and practices of the populations and human relations; (viii) install the asphalt
mixing plants outside inhabited areas in order to minimize nuisances generated by gas, noise
and fume emissions.

6.29 To limit long-term impacts, the following are also envisaged: (i) information and
training on the definition of FMU 11 003 and 11 005 and other environmentally-sensitive
areas (ESA) and related restriction through information boards at entries and along the road;
(ii) limitation of the provisional right-of-way to the right-of-way of the present road and the
built road and to defined quarry sites; (iii) prohibition, in particular, of additional deviations,
felling, operations, traffic and creation of quarries outside these right-of-ways in the ESA;
(iv) speed limits at inhabited zones (signposts); (v) creation of speed bumps at entries to
localities, before and after schools and markets; (vi) placing of barriers between the schools
and the road. All these measures will be described in detail in the Environmental and Social
Management Plan (ESMP) and will be inserted in the specifications of contractors for
monitoring and implementation.

6.30 The project has envisaged sensitization campaigns among school children,
roadside dwellers, village heads, local and governmental authorities, economic groupings,
and transport sector operators. Throughout the entire project, four sensitization campaigns
will be organized per year. These campaigns will use schools, newspapers, the radio and
television as means of information on problems of health, STI/AIDS, water-borne diseases,
environmental protection, land management, bush fire problems, destruction of forests, good
farming practices, soil conservation, road safety, safeguarding of customs and practices,
cultural and moral values, good citizenship, early pregnancies, etc. Seminars will be
organized by specialized NGOs recruited for this purpose.

During the operational phase

6.31 Impact mitigation measures during the operational phase will primarily concern
the following aspects: periodic maintenance, implementation of mitigating measures,
application of legal and safety measures and transport and transit facilitation actions. The
maintenance program to be put in place by the ministries in charge will notably ensure the
regular inspection and where necessary, the clearing out of all drainage works. The material
and financial means necessary for these activities will be earmarked in the annual budget of
the said ministries. To strengthen positive impacts, recruitment will give priority to local
workforce, notably women and youth.

6.32 The putting in place of mechanisms for sensitization, information and controls
(technical, road, traffic code, forestry, etc), should make it possible to cope with these
potential impacts. Ultimately, the improvement of the road infrastructure will, in the
operational phase, generate far more beneficial effects than the foreseeable negative impacts.

6.33 Regarding transport and transit facilitation on the corridor, the program will focus
on secured transport (transport by containers, tankers or sealed trucks). To limit checks at
departure points, at the borders and at arrival points, the following measures are envisaged:
(i) installation a goods monitoring system; (ii) installation of a radio communication system;
(iii) construction at the border of the two countries on the Mamfe-Ekok-Mfum section of a
juxtaposed checkpoint which will be equipped with a weighbridge/axle-load scales, scanner
and computer equipment.
An Environmental and Social Management Plan (ESMP) has been drawn up and presents all the actions to be implemented to limit, mitigate or remove the identified potential negative impacts and defines the various responsibilities for the implementation and control of these measures during the execution and commissioning phases. These actions concern mitigating measures, control and monitoring measures as well as attendant measures necessary as regards improvement of the living environment of the populations, sensitization and capacity building. The measures specified in the ESMP will be included in the bidding documents of the bidders for implementation and monitoring.

The costs of the environmental protection measures, ancillary works and expropriation and compensation under the program are as follows:

(i) monitoring of the implementation of environmental measures included in the works monitoring cost: CFAF 105 million
(ii) protection of natural resources, embellishment of village entries and exits, landscaping; reforestation of cleared areas or bared sites, compensatory tree planting, etc.: CFAF 125 million, of which CFAF 25 million for forest resources protection measures;
(iii) sensitization to road safety and protection, STI/HIV AIDS, water-borne diseases and insalubrity, moral values, environmental protection, etc: CFAF 70 million;
(iv) compensation for expropriation of property (dwellings, churches, graves, crops) financed by the Government: CFAF 457 million.

The other costs concerning the restoration of borrow sites, road signs, protection of slopes, etc. ancillary works and appurtenances to improve the living environment and conditions of the populations, etc. are included in the cost of works.

ENVIRONMENTAL RISK MANAGEMENT

During the road construction and rehabilitation phase, the environmental risk will essentially concern: spillage of hydrocarbons, bituminous substances, explosive products and other substances used in road construction. Risks of accidents at work places as well as stream and river crossings could arise, and also cases of fires for which safety measures and training are envisaged with the appropriate services, in particular, civil protection, gendarmerie, forest rangers etc. These measures concern:

sensitization and training of project site workers and ad hoc teams in rapid response techniques in the event of disasters,
safety measures to follow in the danger or risky zones, establishment of contracts with the workers’ health services and health centres, installation and supply of pharmacies,
sensitization of local populations with regard to prevention against health risks and road safety;
organization of epidemiological surveys in order to assess project impacts on the environment and human health, installation of communication and rapid evacuation equipment.

Other technical measures concern the provision of areas for truck servicing and for the storage of the polluting substances in order to avoid any spillage likely to pollute the natural resources. On-site measures will be taken in order to ensure good retention around the fuel, oil and bitumen storage tanks, and also provide pits for the evacuation of oils, greases and other liquid pollutants from the maintenance workshops, vehicles and equipment cleaning facilities and cargo loading areas. Regarding explosives management, safety measures will be implemented in accordance with the provisions of the Mining Code of Cameroon (Act No. 2001/001 of 16 April 2001).
8. **PROGRAM MONITORING**

8.1 Under this project, program monitoring is aimed at ensuring the effective implementation of proposed mitigating and improvement measures during the successive phases of the project, namely construction, rehabilitation and operation.

8.2 Environmental monitoring to be carried out is designed to check the effective implementation of: (i) the measures proposed in the environmental and social impact assessment, notably mitigating measures; (ii) the conditions laid down in the various laws and regulations; (iii) the commitments of project owners and contractors; (iv) the requirements of the other laws and regulations on hygiene, public health, management of the living environment of the populations, environmental protection, natural resources, sensitive or vulnerable areas.

8.3 The key objectively verifiable indicators which will be used to monitor the impacts will be: the regeneration rate of deforested areas; the number of erosion control structures and gutters around work camps, borrow sites and quarries and storage sites; the turbidity and changes in colour of stream waters (analyses will be conducted in an approved water laboratory); success rate of sown species; the number of water analyses and water quality; the number of social and health facilities created and operational; the number of consultations for water-borne diseases in the health centres of neighbouring areas per quarter (health service); the trend of the number of accidents due to traffic disturbance during works; the number of road signs put in place; the number of consultations for respiratory diseases, cough and bronchitis in the health centres per quarter (health service); the number of sensitization sign boards put in place; the number of consultations with the political, administrative and local government authorities; the number of jobs created for local workers; the number of expropriated households compensated (including compensation time-frames and adequacy of the compensation received against the value of the property expropriated); the prevalence rate of diseases related to dust and gas emissions, the number of cases of water-borne diseases or STI/AIDS and other infectious diseases recorded by health centres since the commencement of the project and their treatment; the number of cases of accidents, the number of reports of collisions with wild animals, etc. The analysis of these indicators is the main input of the monitoring reports and the basis of the suggestions for the replacement of ineffectual measures.

8.4 All these concerns will be taken into account and appropriate measures should be included in the specifications of the contractor for implementation. The implementation of environmental measures will be monitored by the environmental expert of the control mission in collaboration with the Environment Service of the Department of Transport Infrastructure Programming of the Ministry of Public Works, Equipment and Construction. Its tasks will be to monitor the implementation of the ESMP, the implementation of specifically environmental works and the search for the solutions to any environmental problems that may arise. The biological and abiotic environment monitoring indicators, as well as the pollution indicators will be defined in detail by the control mission environmentalist. Furthermore, the ministry of the Forest Economy, Forestry and Fishery, that of the Environment and Protection of Nature (MEFEPE), will carry out the control and monitoring of the implementation of the ESIA, the ESMP and RP.
9. PUBLIC CONSULTATIONS AND INFORMATION DISSEMINATION OF INFORMATION

9.1 The environmental and social impact assessment (ESIA) was conducted using a participatory methodological approach based, on the one hand, on field trips, exploration of background documents, digitalized topographic charts, and on the other hand, discussions with the various ministries, technical services, NGOs, private sector operators, socio-professional groupings, donors, local populations, the authorities and the local communities, village heads and opinion leaders. During each meeting organized, the project contents, in terms of economic, social, cultural, environmental stakes as well as mitigating and improvement measures were presented to the consulted groups. This process was initiated upstream of the project during the validation of the terms of reference of the environmental and social impact assessment by the groups concerned and/or affected. Thus, the opinions and comments of the populations and target groups are incorporated in the ESMP.

9.2 During project implementation, all these partners will be consulted regularly. The ESIA has been made available to the public, by the Ministries in charge of the environment, through the public press and during village meetings for comment. In addition, this summary will also be published in the Public Information Centre (PIC) of the Bank.

10. SUPPLEMENTARY INITIATIVES

10.1 To reduce the negative impacts and improve the positive impacts of this program, a series of supplementary measures to improve the living environment and conditions of the local populations have been included therein. These measures will include the implementation of a resettlement plan and related works.

Expropriation, Compensation and Resettlement

10.2 The implementation of this program will entail the expropriation of houses, land and crops of roadside populations in certain villages. In conformity with Bank resettlement policies as regards involuntary population displacement and those of Cameroon in that domain, a resettlement plan (RP), has been prepared. This RP had the approval of the Government and the affected populations. In addition, measures taken to minimize the correction of the road alignment made it possible to reduce to the maximum the crossing of population centres and displacement of populations and expropriations, while ensuring optimum safety. The Consultant initiated an evaluation of the present value per m² of the buildings and lands affected by the program. That enabled calculation of the costs of rebuilding new houses or other buildings in the areas demarcated for the road project. Another evaluation was made of the present cost of building other commercial buildings, shops, factories, etc. affected by the program.

10.3 It is envisaged that within the framework of this program, the following will be expropriated: 93 dwellings, the majority of them of semi-permanent materials, belonging to 92 owners (82 families), crops belonging to 322 owners; 2 churches, 3 community drinking water supply systems, a drinking water tower with accessories, 10 wells, public social amenities (residence + kitchen + classrooms (4), (1) Offices at Ekok market, shop leased to Kalu, shop leased to Enowbi B. Lidia) of an area of 938.8m² have not been evaluated. The costs of these compensations stand at CFA 385 351 042, broken down as follows: total cost of crops, CFA 196 558 315; total cost for buildings CFA 178 982 727; buildings and
other accessories, CFAF 626 029 205; crops, CFAF 474 679 800; total cost for 5 built graves, CFAF 1 150 000; total cost for 14 drinking water supply systems, CFAF 8 660 000. By adding 25% for contingencies (price contingency, identification of other properties to be expropriated during the project, etc.), the total cost of the expropriation is approximately CFAF 481 688 803. On this section, part of the compensations has already been paid and the rest will be paid soon.

10.4 This displacement consists in shifting back less than 75 meters from the road right-of-way. As the populations are attached to their homeland, they are unwilling to move. It is not therefore a question of mass displacement of several households from one place to another, but rather of individual, light and localised displacements of every household concerned. The owners (in the case of plots) of the parcels affected by the project have already been notified and will be compensated according to the procedures for those who have not yet been paid, notably victims on the Numba-Batibo section and a few on the Mamfe-Ekok section. The affected communities participated massively in the preparation of an expropriation and resettlement plan and their concerns were taken into account. The option of reducing to the barest minimum the involuntary displacement of populations has been taken into account, in order to limit the demolition of private properties.

10.5 It should be noted that any person displaced, with or without property, will receive compensation representing to the value of any property of which he has been dispossessed. If such property is a house for instance, the said compensation shall be of a value at least equivalent to that from which he was displaced and an amount enabling him to build one. In case of loss of his properties or equipment as a result of the displacement, the displaced person shall receive financial compensation at least equivalent to what he has lost.

10.6 The affected populations were informed of the nature and utility of the project as well as principles of compensation and resettlement. Government services came to identify the houses to be demolished, the crops to be destroyed, and to evaluate the amount of the compensations. Information and sensitization were carried out on an individual basis, since, for each village, the number of households affected is relatively low.

10.7 The issue of compensation for the dwellings, land, crops and all the other forms of compensation was tackled during the consultative phase. The following compensation conditions were proposed: (i) compensation in cash for any loss of land; (ii) compensations in cash for buildings and walls; (iii) compensation in cash for destruction of crops; (iv) grant of sufficient time to affected persons to harvest crops from their fields and/or for resettlement after the compensation operations.

10.8 The customs and practices will be respected during work and more particularly during exhumation and burial. About 7 (seven) graves were identified at the time of the investigations. In addition to sensitizing local populations to STIs and AIDS, other topics will be dealt with in particular: road safety, bush fire use, child trafficking and exploitation, cultural values and environmental protection.

Related works and measures

10.9 Related works will under this programme will concern: the improvement of rural tracks, the rehabilitation government primary schools, with supply of benches; construction of latrines, fences in schools; rehabilitation of the women’s advancement centre; construction
of youth halls, and centres each comprising a food processing unit; rehabilitation of health centres; rehabilitation of market sheds; water supply through the provision of boreholes and wells; provision of farm produce drying yards; provision of three playgrounds in the three primary schools in Eyumedjock town; etc.

11. CONCLUSION AND RECOMMENDATION

The environmental impact assessment conducted shows that the implementation of the project will definitely have negative impacts on the natural, human and socio-cultural environment. However, these potential negative impacts will have no major irreversible ecological effects on the project area and its environs. In fact, these potential negative impacts could be circumscribed technically and financially within reasonable limits or even be offset by appropriate corrective measures, through the implementation of the ESMP. This summary of the potential impacts and mitigating measures of the program is submitted to the Board of Directors of the Bank for information.