



REPUBLIC OF ANGOLA



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v2

MINISTRY OF PLANNING

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PROCESS FRAMEWORK REPORT

VOLUME 2 - ENVIRONMENTAL AND SOCIAL
DIAGNOSIS AND INSTITUTIONAL AND LEGAL FRAMEWORK



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ANNEX: EMRP Subprojects Activities by Sub-component and by Time Period

1 - INTRODUCTION

The present document regards Volume 2 – Environmental and Social Diagnosis and Institutional and Legal Framework, concerning the contextualisation of the Emergency Environmental Multisectorial Recovery Project (EMRP), carried on by the SOAPRO / PROCESL consortium, for the Ministry of Planning of the Republic of Angola.

This Report is intended to present the first stage of the assessment process, which consists in creating the necessary databases for the social and environmental assessment of EMRP's sub-projects.

This document starts off in Chapter 2 by setting the objectives of the EMRP, its sectorial components, the entities responsible for the Projects, together with the present situation of project development and future expectations.

2 - THE EMERGENCY ENVIRONMENTAL MULTISECTOR PROJECT (EMRP)

2.1 - EMRP'S OBJECTIVES

EMRP's main objective is to help lay the foundations for the long-term reconstruction of the State Administration of the Angolan Republic, following the next specific aims:

- a) Increase the agricultural income and food security in the provinces most affected by the conflicts;
- b) Improve the access to education and essential healthcare in the provinces most affected by the conflicts;
- c) Repair and rehabilitate critical infrastructures;
- d) Strengthen the institutional power at all levels to formulate, prepare, establish and manage the development of programmes in both medium and long term periods.

The EMRP aims to aid the regeneration of the transport network and improvement of the conditions of the public services. It is intended to prevent the deterioration of health and the loss of life through healthcare and other basic services by rehabilitating the services of water supply and improving public health in cities. It will also help reduce poverty in both rural and urban areas by encouraging agricultural production and reducing time and costs associated with food transportation from producers to the market.

EMRP will assist Angola in achieving legal and regulation improvements as well as more efficient institutions for a better govern. Lastly, it will lay the foundations of mid and long term institutional and political reforms needed in Angola.

2.2 - PHASING

World Bank finances the Project in two coherent and complementary phases.

The first phase is oriented towards the most urgent needs and includes the following activities:

- Encouragement of agricultural activities (especially the production and multiplication of seeds and equipment for plantation);
- Purchase of medicines, logistic support and training courses for nurses and nursing auxiliaries to health services;

- Purchase of educational materials and recruit of teachers and assistance to begin teacher training;
- Basic support to the rehabilitation of water supply services in Luanda and three additional capitals of province;
- Technical assistance and improvement of the Ministries and agencies capability to implement programmes and projects;
- Training courses;
- Technical assistance to strengthen the local power to prepare decentralisation;
- Social and environmental assessment of projects.

2.3 - COMPONENTS OF THE IDA PROJECT

The Projects presented in Report n.º T 7 649–AO are grouped in four components, namely:

- Component A – Rural development and social sector support;
- Component B – Reconstruction and Rehabilitation of critical infrastructures;
- Component C – Strengthening of Institutional Capability and Sectorial Strategies Development;
- Component D – Management and Monitoring of the Programme.

Next, the Components, The Sub-components of EMRP, as well as their goals and activities, will be introduced.

2.3.1 - Component A – Rural Development and Social Services Scheme

2.3.1.1 - Sub-component A1: Agricultural and Rural Development

Objectives

Objective 1: Support small farmers who restart their agricultural production and improve the level of food security.

Objective 2: Strengthen the capability of the research and extension services.

Objective 3: Encourage the institutional progress of the Ministry of Agriculture, raising its power to coordinate and create strategies to develop agriculture and rural areas.

Objective 4: Stimulate marketing.

Objective 1: Support small farmers who restart their agricultural production and improve the level of food security

Activities

(i) Production of basic and pre-basic seeds and vegetative material:

- Increase EDA's production capacity in the provinces of Malange, Bié and Huambo, thanks to the purchase of vehicles (4 vans, 2 tractors, 16 pick up vehicles and 5 4x4 Jeeps) and 20 scooters;
- Production of basic seed and vegetative materials to plant (Acquisition contract of Fertilizers for Chianga–Huambo – Part 1).

(ii) Multiplication of seeds and vegetative material:

- Establishment of multiplication fields (12 EDA's to be rehabilitated in the provinces of Malange and Bié);
- Distribution of necessary basic tools to multipliers and ready to plant materials to farmers.

Objective 2: Strengthen the capability of the research and extension services

Activities

- Training courses for MINADER professionals (SENSE, IIA and IDA).

Objective 3: Encourage the institutional development of the Ministry of Agriculture, raising its power to coordinate and create strategies to develop agriculture and rural areas

Activities

- Technical assistance to IIA, IDA and SENSE.

Objective 4: Stimulate marketing

Activity

- Detail project to repair rural routes in the provinces of Malange and Bié.

2.3.1.2 - Sub-Component A2: Health

Objectives

- Objective 1: Increase access to essential healthcare services
- Objective 2: Improve the quality standards of health services
- Objective 3: Increase the control over sexually transmitted infections and HIV/AIDS in target groups
- Objective 4: Strengthening of healthcare institutions

Objective 1: Increase access to essential healthcare services

Activities

- Assessment of needs for medical attention in the province of Moxico and, in a municipal level, in three other provinces;
- Provide health facilities with proper equipment, including laboratorial material, pharmacy and furniture;
- Evaluation of the needs for medication in the Ministry of Health.

Objective 2: Improve the quality standards of health services:

Activities

- Provide medicines and essential materials:
 - Parts 1, 2 and 3 for the Acquisition of Medicines for Health Units and Centres and Referential Units;
 - Purchase of 4 ambulances and four 4 × 4 vehicles;
 - Purchase of 8 bicycles and 8 scooters
 - Human Resources Training.

Objective 3: Increase control of sexually transmitted infections and HIV / AIDS in target groups

Activities

- Various projects about hiring advisory services.
- Radio campaigns.

Objective 4: Strengthening of healthcare institutions

Activities

- Support the revision of Health policies.
- Strengthen the ability of provincial and municipal health groups:
 - a) Technical Assistance to the four Provincial Health Delegations;
 - b) Detail design of Infrastructures in Health.

2.3.1.3 - Sub-Component A3: Education

Objectives

- Objective 1: Improve the quality standards of the educational services
- Objective 2: Strengthen the institutional capabilities of the education sector
- Objective 3: Prepare Phase 2 for the educational component of the project

Objective 1: Improve the quality standards of the educational services

Activities

- Supply of pedagogical resources – printing and distributing school books and teachers’ guides;
- Supply of didactical materials;
- Purchase of study kits for students and teachers and other classroom materials;
- Teacher training.

Objective 2: Strengthen the institutional capabilities of the education sector

- Nomination of a focal point in the Ministry of Education for EMPR’s issues.

Objective 3: Prepare Phase 2 for the educational component of the project

Activities

- Construction of Primary Schools;
- Acquisition of school manuals, teachers’ guides and other learning materials.

2.3.2 - Component B – Reconstruction and Rehabilitation of critical Infrastructures

2.3.2.1 - Sub-Component B1: Water

Objectives

- Objective 1: Drinking water supply to Kuito
- Objective 2: Drinking water supply to Malange
- Objective 3: Drinking water supply to N'Dalatando

Objective 1: Drinking water supply to Kuito

Activities

- Studies, detail design and tender documents for the water supply works for Kuito city.

Objective 2: Drinking water supply to Malange

Activities

- Studies, detailed design and tender documents for the water supply works for Malange city.

Objective 3: Drinking water supply to N'Dalatando

Activities

- Studies, detailed design and tender documents for the water supply works for N'Dalatando city – Part 1;
- Studies, detailed design and tender documents for the water supply works for N'Dalatando city – Part 2.

2.3.2.2 - Sub-Component B2: Power

Objective

- Objective 1: Rehabilitate electrical power distribution network in 5 provinces
- Objective 2: Rehabilitate electrical power distribution network in the city of Luanda

Objective 1: Rehabilitate electrical power distribution network in 5 provinces

Activities

- Studies, detailed design and tender documents for the network, under the supervision of Empresa Nacional de Electricidade, ENE.
- Studies, detailed design and tender documents for the electrical power distribution network of high, medium and low tension for some areas of the city of Luanda, under the supervision of EDEL (Empresa de Distribuição de Electricidade de Luanda).

2.3.2.3 - Sub-Component B3: Urbanism

Objective 1: Rehabilitate focal zones of the drainage and sewerage system of Luanda Objective 2: Control erosion in Moxico

Objective 1: Rehabilitate focal zones of the drainage and sewerage system of Luanda

Activities

- Detailed design of top priority works in the drainage and sewerage system in Luanda.

Objective 2: Control erosion in Moxico

Activities

- Detail design of top priority works relative to erosion control in Moxico.

2.4 - RESPONSIBLE ENTITIES

The Ministry of Planning is the entity in charge of the coordination of EMRP. Nevertheless there are other entities involved in its execution, specifically:

- Ministry of Energy and Water (MINEA);
- Ministry of Agriculture and Rural Development (MINADER);
- Ministry of Health (MINSA);
- Ministry of Education (MED);
- Provincial Government of Luanda;
- Empresa Nacional de Electricidade;

- Empresa de Electricidade de Luanda.

Regarding EMRP’s local agricultural development component, it is expected to contribute to reorganizing and strengthening of SNS – National Seed System, which will consist of three entities:

TABLE 2.1
Entities of the National Seeds System

IIA (Instituto Investigação Agronómica)	Investigation and production of genetically-enhanced, pre-basic and basic seeds.
SENSE (Serviço Nacional de Sementes)	Production policies control, certification, quality, imports and exports of seeds from/to Angola.
IDA / EDA (Instituto de Desenvolvimento Agrícola / / Estação de Desenvolvimento Agrícola)	Technology trading through the use of seeds from public and private producers.

This Social and Environmental Diagnosis demands the contribution of the Ministry of Urbanism and Environment, entity dealing with environment in the Republic of Angola.

2.5 - PRESENT SITUATION OF PROJECT’S DEVELOPMENT AND FUTURE PERSPECTIVES

The EMRP sub-projects will be developed during two phases; the present situation is summarized on the Tables in Annexes, where they are presented, by sub-component and by time deadline. The EMRP’s activities are actually in development and will have the contribution of environmental and social component.

The sub-projects that start in phase 2, and did not start yet, will have a more contribution of the environmental and social component.

3 - ENVIRONMENTAL AND SOCIAL DIAGNOSIS FOR THE REPUBLIC OF ANGOLA AND PROVINCES INVOLVED IN EMPR

3.1 - INTRODUCTION

This chapter is intended to provide a description of the environmental picture, considering its biophysical component, air quality and social, economic and cultural aspects of the Republic of Angola and provinces of EMPR sub-projects.

Factors that may, directly or indirectly, be affected by EMRP will be subject to a more detailed study.

3.2 - GEOGRAPHICAL SITUATION

Angola is situated along the western coast of Africa, between equator and the tropic of Capricorn, being bordered by the Republic of Congo (Brazzaville) and Congo (Kinshasa) in the North, by Zambia in the East, by Namibia in the South and by the Atlantic Ocean in the West (Figure 3.1).

We can find the province of Cabinda in the north banks of Zaire, in a region separated from this river by a strip of Congolese territory (Kinshasa).

The total area of Angola is 1,246,700 km², which represents 4% of Africa and about half of Western Europe. The land boundaries measure up to 4,837 km and the sea boundary is 1,650 km long.

3.3 - CLIMATE

The Angolan climate is influenced by several parameters such as latitude, longitude, orography, closeness to the ocean and the cold sea stream of Benguela.

Considering the cumulative effect of these parameters, the climate in the northern coast is wet and warm and, heading south, tropical coastal with high air humidity. Going inland, the distance to the sea and altitude bring increased precipitation and lower temperatures.

In general, all Angolan territory experiences two seasons: a fresh dry season, from July to the end of September, and a hot rainy season, from October to March.

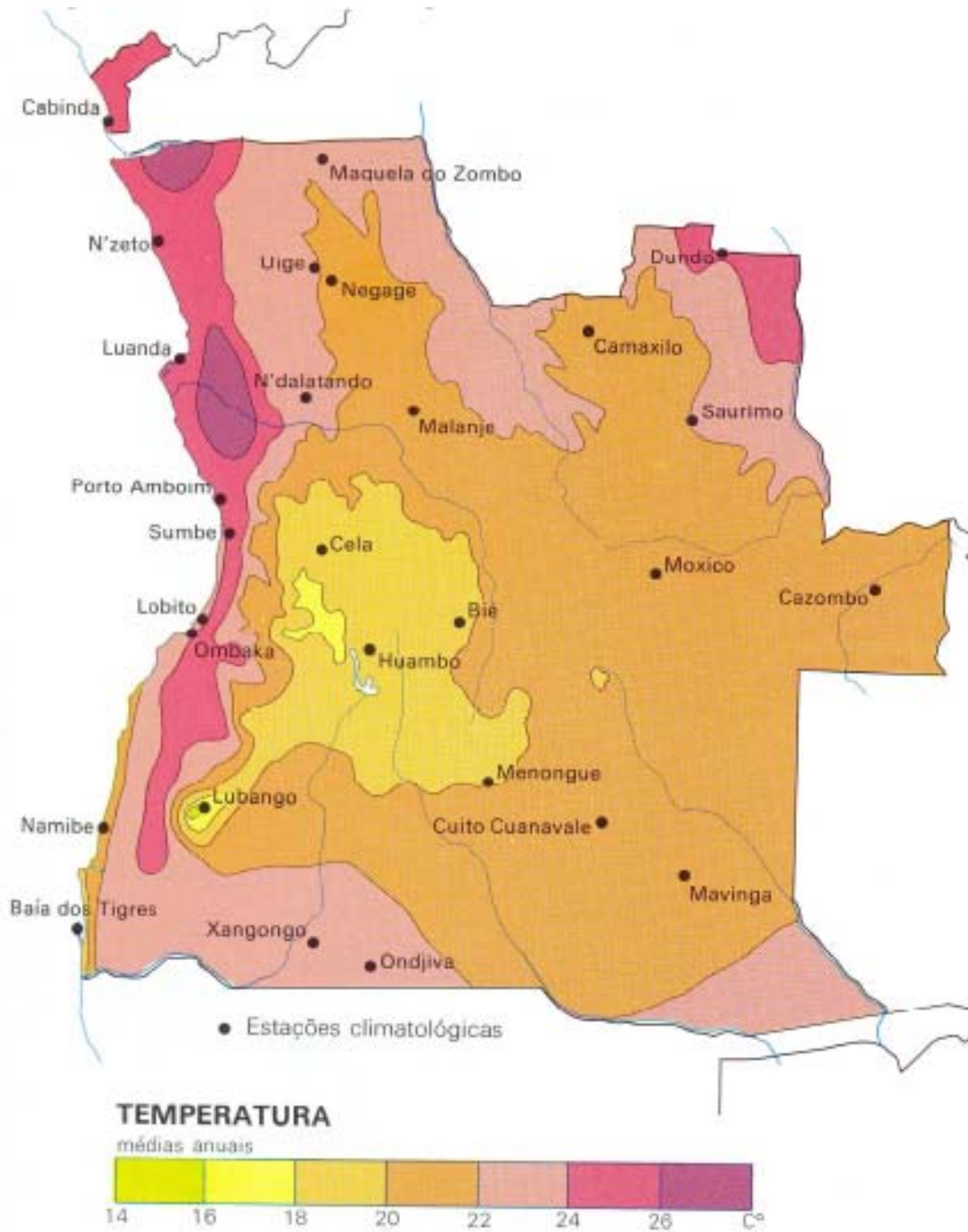
The annual average temperatures are higher in the North and they become lower as we approach the southern and inland regions. The highest average annual temperature varies from 25° C to 27° C (in Congo basin region) and the lowest varies from 15° C to 20° C (in the plateau along the Namibe desert).



FONTE: FAO / MINADER 2006

FIGURE 3.1
Administrative Limits of the Angola's Provinces

Figure 3.2 presents the (annual average) temperatures distribution as well as the localization of weather stations in Angola.

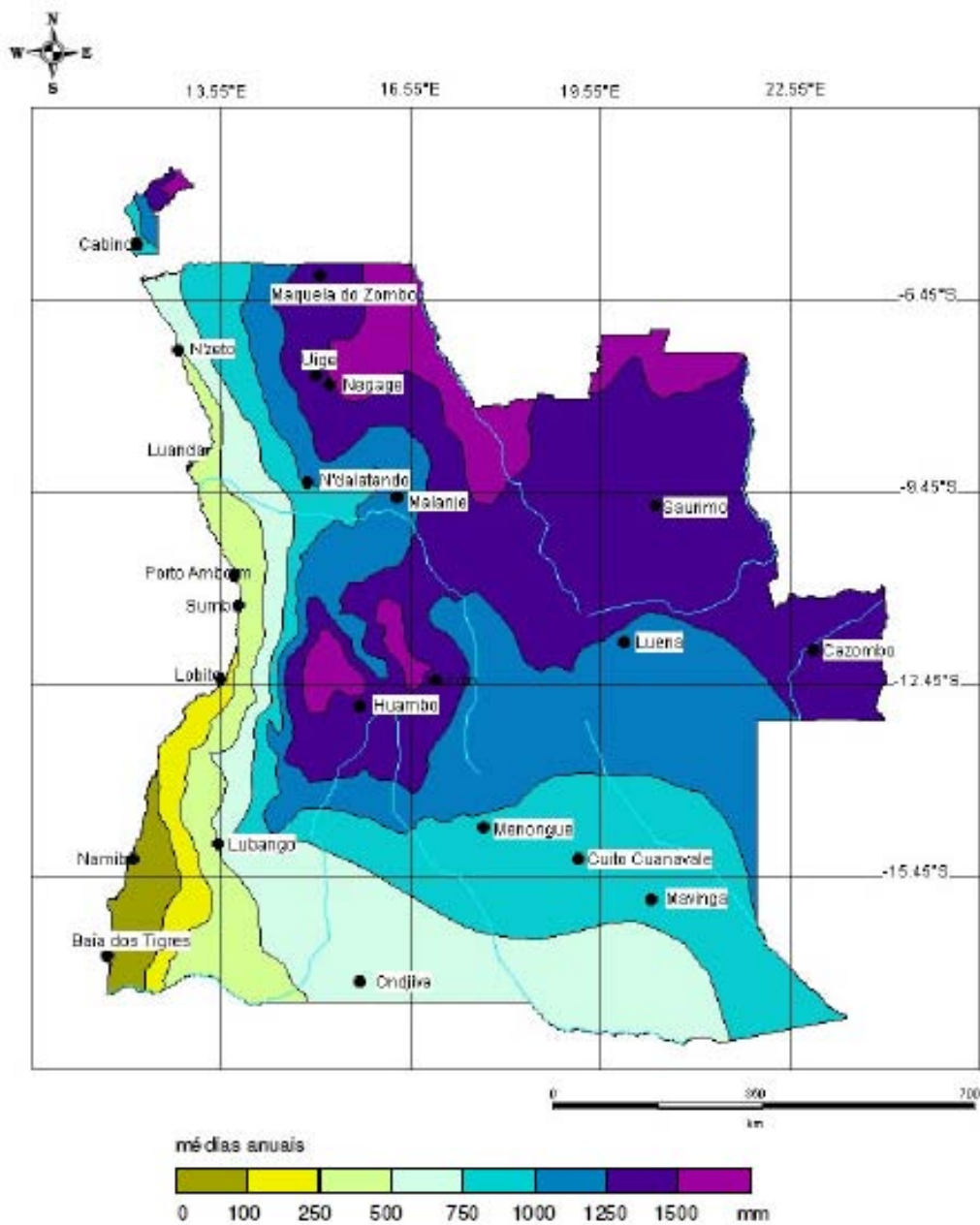


SOURCE: FAO, 2005

FIGURE 3.2
Temperature Distribution

Precipitation, is very low in the coastal areas, rising with altitude and declining as we go inland. The lowest annual average precipitation is 100 mm (in the Namibe desert) and the highest is 1,750 mm (in the plateau).

Figure 3.3 presents the (annual average) pluviosity in Angola.



SOURCE: FAO, 2005

FIGURE 3.3
Pluviosity Distribution

The main pressure centres that influence the climate in Angola are: the almost permanent subtropical anticyclone of the Atlantic Ocean, the African continent's anticyclone and the equatorial depressionary valley.

From September to January, it is clear that the equatorial depressionary valley moves South and, from January to May it moves North, dragging the unstable equatorial air, with strong convergence to lower levels, to Angola. It can be said that precipitation is also influenced by local factors, like the Huíla and the Huambo plateaus, in which case orographic features are stronger than general conditions.

Between May and August climate suffers a stronger influence from the African continent's anticyclone, which transports the dry and stable continental air, with temperature inversions in lower layers, over Angolan territory.

In Angola's coastal areas, the South Atlantic anticyclone is more intense, bringing the remaining tropical air to these regions during the dry season. Although it is weakened, this effect also takes place during the rainy season causing irregular precipitation.

The west average components reach a long vertical extension (over 6 km) in December, January and February and an intensity maximum in February, according to some published data on dynamic climatology in meridional Africa, with reference to stations in Luanda, Lobito, Malange and Huambo. During this period, inland regions experience heavy rains and in coastal areas west of 16° E precipitation is rare, originating long droughts.

The heavy rains in coastal areas that occur between March and April are originated by the eastern flux, which brings the remaining equatorial air from the plateau to coastal areas.

3.4 - OROGRAPHY

The orography of Angola shows a set of peculiar and perfectly defined features, determining four different zones:

- the **littoral strip**, a lowland, with altitudes between 0 and 400 meters, that narrows gently from North to South until near parallel 13°, to enlarge again;
- the **sub high plain zone**, between 400 and 1,000 meters, which develops along the preceding one, but that in the North turns inland, occupying a great part of Zaire basin in Angolan territory, also very narrow between parallels 10° and 13°;
- the **first high plain zone**, which occupies the majority of the territory with a gentle slope from the centre of Angola towards South, East and Northeast;

- the **second high plain zone**, the real heart of the territory although occupying the western half of it, with altitudes about 1,500 meters, in which the peaks of certain mountains reach 2,600 meters.

The hydrographical network is a direct result of the previously mentioned landforms. All great Angolan rivers, such as the Cuanza, the Cunene and the Cubango, emerge from the second high plain zone, which can be called the great hydrographical centre.

All western strip from Zaire to Cunene is a drainage zone at the final stretch of the rivers that, being born in the high plains, run parallel to each other from East to West towards the ocean, with high slope stretches, including rapids and waterfalls, before they reach the coast.

So, the **Angolan terrain** can be divided, according to the type of development, the specific characteristics of geological, structure and neo-tectonic constitution and the nature of exogenous processes, into two zones:

- the central massif;
- the littoral depression.

3.4.1 - Continental “Massif” Landforms

Considering its features, the national territory is divided into two parts: **western** and **eastern**. The eastern part is dominated by accumulation landforms while the eastern part mainly forms denudation terrain with intense erosion processes still happening nowadays.

The western part of Angola comprises the **Central Plateau** with stair-form landscapes, the **Maiombe denudation plains**, the **Cuanza–Longa plains**, the **Zenza–Loge plateau**, the **coastal plain** and the **Namibe accumulation plain**.

The positive morphological structures are associated to the shields of Angola and Maiombe, whereas negatives are connected with the Periocenic Depression and the northwestern part of the Congo depression.

The Central Plateau, with the stair-form landscapes, settled over Archaic and precocious Proterozoic rock formations from the Angolan shields whose levels reach 3000 m. The plateau is limited in the West by the “great escarp” and the denudation plains zone that forms steps which fall down to the coastal plain. High above the “Great Escarp”, the plateau declines to East and Southeast, shaping the denudation plains. The western part of the plateau reveals “in mesa” structured mountains. In the interfluves and “in mesa” mountain bases lateriticial cuirasses have developed. The river valleys present different shapes. In the “great escarp” zone, they are deeply fit

in, reaching 600–700 depths. In southern Angola, the Humpata plateau massif, with levels that reach 2,300 m, is the alongment of the Central Plateau. In the West, the referred massif is limited by the “Great Escarp”, while in the East it gradually turns into the accumulation plains. In the South, the massif is entailed in river Curoca’s valley plateau, with depths of 200–240 m.

The formation of **denudation plains of Maiombe** occurred over metamorphic and magmatic rocks from the Maiombe shield. They rise softly from the littoral strip towards East and Southeast, their absolute levels varying between 0 and 1000 m in the medium stretch of rivers Dange and Zenza, being the depth of dissection of the plains from 20 to 100 m. Plains of Maiombe are separated from the Central Plateau by a step of the Cuanza horst, which direction is latitudinal.

The plains of the upper stretches of Cuanza–Longa are connected to the east extremes of the Angola and Maiombe shields, being crossed by large river valleys which pass softly to interfluvia. In the northern part of Maiombe shield, plains are limited by a degree 500 m high.

The **Zenza–Loge “plateau”** is constituted by deposits of the Super Group of Western Congo. The lined sub-meridional orientation of all the landforms outstands as a specific characteristic of the “plateau”. The interfluvia have hills in the form of steps with altitudes from 300 to 400 m. South and Southeast of the “plateau”, absolute levels reach 1500 m. The orientation of “cordilheiras” and of the lowlands between them matches with the direction of “dobramentos”. Locally, the bottom of the valleys shows residual testimony of denudation with altitudes of 250–300 m.

The negative morfostructure of the northwest part of Congo depression includes the plain of Cuango, strongly dissected, with the Cassanje depression. The plain of Cuango was formed over the continental sub-horizontal deposits of late Mesozoic and Cenozoic. At its centre the Cassanje depression can be found, resulting from tectonic movement and erosion phenomena. The higher absolute levels (from 1200 to 1300 m) occur in the south-eastern and eastern parts of the plain. Locally, their landforms show blocs and “cordilheiras” not much developed. The river valleys have a “V” shaped transversal cut, their depth being 100 to 150 m. Hydrographic network is reticulate. The depression of Cassanje formed over the sub-horizontal deposits with “mantos lávicos” from the late Paleozoic-Mesozoic and follows from Southeast to Northwest during about 300 km and has about 100 km width. The bottom of the depression has two levels (from 800 to 1,000 m and from 600 to 700 m), separated by steps with altitudes varying from some tens to 100 m. River valleys have smooth hills.

The **coastal plain**, with soft landforms, formed over the meso–cenozoic marine deposits of the Periocenic Depression. Its width is no more than 15–30 km, as a rough rule. At the vicinity of the mouth of rivers Zaire and Cuanza, that plain enlarges from 100 to 300 km, constituting the coastal

basins with the same name. At the Cuanza basin coastline is crossed by lakes that fulfil tectonic flaws with several orientations. The “morros” and “cordilheiras” that emerge from the plain are formed in the emergent spots of cohesion rocks that resist to erosion processes. Depressions in arch that appear on the landforms are probably structures of salt domes. Along the coastline there exists a degree of abrasion with altitude from 20 to 50 m. At the proximity of the mouth of many rivers there are beaches, accumulation terraces, islands and sandbars with several meters of altitude. Abrasion terraces with altitudes from 145 to 175 m can be found at the South of Angola. The slopes of the valleys are, in general, not very steep, while in the zone with steps formed by abrasion there are gorges with waterfalls. Suspended valleys can be seen. The landforms in the coastal plain were formed due to air denudation. Namibe plain is located at the south-eastern extreme of Angola, North to the mouth of river Cunene and is constituted by modern eolic sands from alluvia. Their altitude increases gradually eastwards, until 200 m. This plain formation results from re-deposition of alluvia from river Cunene.

Landforms at the eastern part of Angola are represented by accumulation plains of the upper stretches of rivers Zambeze, Macondo, Cunene and Maninga, the Cameia–Lumbate depression, the Lunda “plateau” and, at the extreme east, by the elevation of High Zambeze.

The elevation of High Zambeze, formed over the precambrian deposits. Their landforms result from erosion and accumulation phenomena. The absolute levels of elevation, increasing to Northeast are 1000 to 1200 m, the dissection depth being several tens of meters. The orientation of the main landforms coincides with the NE direction of the “dobramentos”.

The accumulation plain of the upper course of rivers Macondo e Maninga, located at Southeast of the elevation of High Zambeze, is constituted by deposits of the Macondo formation. Landforms are represented by a “plateau” with absolute levels from 1200 m at Southeast to 1500 m at Northeast. The dissection depth is of several tens of meters.

The proluvio–alluvia plain from Lunda “plateau” was formed over the Cassai shield. It is constituted by the “red sands” formation of the Kalahari Group. Their absolute levels are 1,400–1,600 m in the south part of the “plateau”, diminishing softly northwards. The majority of river valleys are of southern orientation and narrow, with terraces of lowlands with 10, 20 and 40 m of altitude, meanders and rapids being very often signalized. The south-western part of the plain belongs to the Okavango morfostructure. Here maximum levels of 1000 m exist, the valleys of the rivers being fit in until a depth of 100 to 150 m. In the valleys neotectonic degrees can be found, the cross section of them being “U” shape. At the south extreme of the plain there are depressions resulting from denudation and deflection, of latitudinal orientation, closed and opened, forming labyrinths. Reception lakes can be found in many lowlands.

The Okavango depression structure includes plains made of sand and clay of the Plistocene–Holocenic age. They are situated in the Cameia-Lumbate depression (the interfluvia of rivers Zambeze and Cassai), originated by tectonic and erosion actions, as well as in the right margin of river Cubango and in the basin of river Cunene. The Cameia–Lumbate depression extends to Southeast for 200 km, its width being 180 km. The absolute levels are 1100 a 1,400 m. In all its periphery the depression is limited by steps with 50–60 m of altitude. It is crossed by a dense hydrographic network. The plain located in the right bank of river Cubango is morphologically identical to the above described. At the southwest extreme of the landforms of Okavango there is the plain of river Cunene. On the plan, it reminds a strangulation opening to the South. The extension of the plain for North to South is 200 km, being 160 km its width along the Angolan border. At the northwestern part of the plain drainage is oriented to river Cunene, while in the south-eastern part water drains towards the reception lake called Etosha (located in Namibia).

In modern times a part of the upper part of Cunene was captured by a river which had its mouth in the Atlantic Ocean. During the floods all the plain was covered with water. At the surface of the plain there are the following landform “mesofomas”: “Mufitos”, “Ecangos”, “Mulolas” (local designations). “Mufitos” are elevations covered by sandy deposits, with trees and bushes; “Ecangos” are assymmetric or oval depressions with surface clay layers covered by salt pellicules; “Chanas” are alongated lowlands with up to 500 m wide, sometimes with clay surface layers; “Mulolas” are narrow beds of temporary watercourses, usually sandy.

At the landforms of the oceanic depression there are the continental platform, the continental embankment and the bottom of the ocean. The continental platform is a sloped plain resulting from abrasion and accumulation processes, 8–10 e 70 km wide (near the mouth of river Zaire). It is the extension of the continental coastal plain, constituted by Meso–Cenozoic sediments, the ancient platform being distinct of the modern one. The average depth of the continental platform is 100 to 150 m.

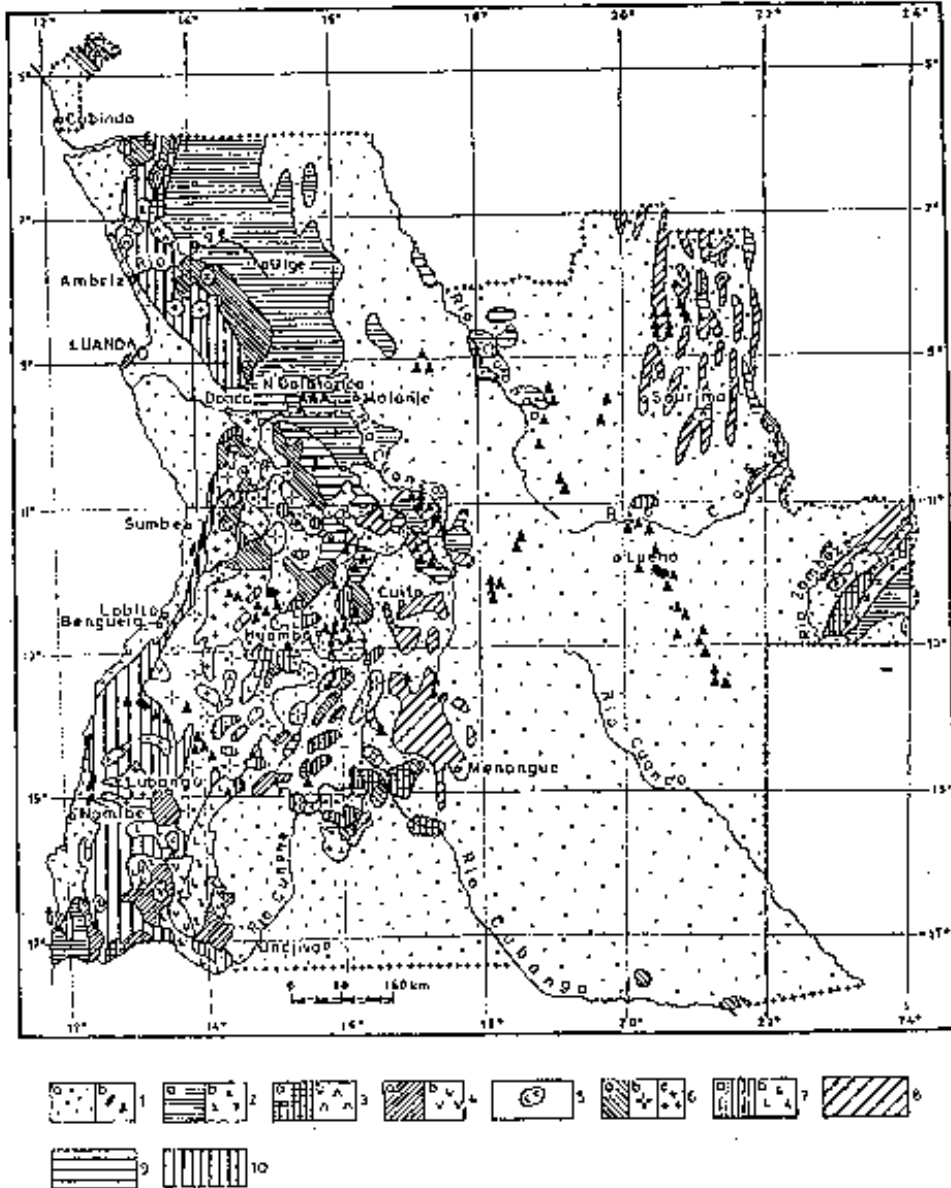
The continental embankment separates the continental platform of the bottom of the ocean through a step with about 550 m of altitude, reaching 850 m near Cabo de Santa Maria. The highest point in the scarp is near the mouth of rivers Coporolo, Catara, São Nicolau and Mutabo. The bottom of the ocean presents as a plain with soft slope at the basis of the continental embankment. Areas adjacent to the continental embankment have a structure like a stair. The maximum depth of the sea bottom is 4,500 m.

3.5 - GEOLOGY

This chapter presents a summary of some considerations about the succession of geological events (Figure 3.4) that developed during the great tectonic cycles and that correspond to the evolution of the earth crust of the territory of Angola within the African platform.

At the early Arcaic cycle (3500–3000 m.y.) the metamorphic and ultrametamorphic structures were formed, represented mainly by several ortognaisses, anfibolites, leptites, quartzites, xists and charnoquites, enderbites, tonalites, plagiogranites and associated tites. It is assumed that at the beginning of the cycle under consideration occurred the installation of rocks of the ofiolitic series in conditions of the primitive crust (protocrust). Rocks of the ofiolitic series, later transformed into sequences of bapiroxenitic and hiperstenic gnaisses with bodies of anfibolites, metagabres and granulites, were preserved only in the southeast part of the Maiombe shield and in the northern part of the Angola shield. Probably of ofiolitic association are the gabro–noritic intrusions of the recent Arcaic from the Maiombe, Cassai and Angola shields. Immediately after the installation of rocks of the ofiolitic series, it started the formation of the primitive vulcano–sedimentary shelter, which served as substrate, in conditions of metamorphism, to different gnaisses as well as to anfibolites and quartzites. At the end of the cycle, as a result of the tectonic accumulation, regional metamorphism (granulitic and anfibolitic facies) and granitization, the structuration of the lower part of the protometamorphic layer occurred; represented by several gnaisses (hornblendic, hiperstenic, with high contents of Al_2O_3 and others), leptites, quartzites, anfibolites, as well as granitoids which composition was mainly diorito–gabrodioritic.

The Late Arcaic cycle (3000–2600 m.y.) was characterized by the continuation of the differentiation of the earth crust, several isolated structural zones having been formed, on which terrigeno–carbonated deposits were accumulated. The launching of processes of metamorphism and granitization led to the selective fusion, originating granitoid rocks of the tonalítico–plagiogranitic series. The generation of granitoids occurred essentially, from the rocks of the Inferior Arcaic, increasing its alcalinity due to the penetration of natrium at the deepest levels. Phenomena of granitization promoted also the formation of granitic domes in great positive structures. Belts of green rocks are characteristic of the Late Arcaic. The pieces of structures of this kind are preserved in the interdomme zones of Maiombe shield. The formation of similar structures must also have taken place in other shields of the Angolan territory, which testifies are the anfibolites, diabasics foliated porfirites and xists derived from effusive acid rocks, that can be found in the cuts of Higher Arcaic.



LEGEND: 1-Fanerozoic: sedimentar rocks (a), and Mesozoic rocks, usually magmatic of the Cretacic (b); 2 – Proterozoic IV (500-1000 m.y.); metasedimentar rocks (a) and magmatic rocks (b); 3 – Proterozoic IV (500-1000 m.y.) ou Proterozoic III (1100-1750 m.y.) or Proterozoic II (1750-2100 m.y.); sedimentar rocks (a) and magmatic rocks (b); 4 – Proterozoic III (1 100-1650 m.y.); metasedimentar rocks (a) and magmatic rocks (b); 5 – Inferior Proterozoic III or Late Proterozoic II (1650-1800 m.y.); magmatic rocks; 6 – Proterozoic II (1800-2200 m.y.); metasedimentar rocks (a), regional granites (b) and granites of Quibala and Vista Alegre type (c); 7 – Proterozoic I (2200-2500 m.y.) or Arcaic III (2500-2000 m.y.); metasedimentar rocks (a) and magmatic rocks (b); 8 – Indifferenciada Arcaic; 9 – Arcaic III (2500-2900 m. y.); 10 – Arcaic II and/or Arcaic I (>3000 m.y.)

SOURCE: “Geologia de Angola” à escala 1/1 000 000 (H. de Carvalho, 1982)

FIGURE 3.4
Geological Scheme of Angola, simplified,

At the beginning of the Early Proterozoic cycle (2600 to 1600 m.y.), at the green rocks “troughs” (Lufico–Cabinda and Cassinga zones), there was intense vulcanism of the andesitic–basaltic type, substituted after some time by vulcanism of riolitic–dacitic type. The presence of espilites at the vulcanites cuts shows vulcanism of the submarine type, while the presence of tufts shows the blasting character of the eruptions. In the vulcano–sedimentary rocks of the “troughs” of green rocks there are iron jazides and copper occurrences (Cassinga zone, Jamba group). Into the interdomme and linear depressions of the regional “arqueamentos” (zones of Oendolongo, Lunda, Alto Zambeze), terrigenous sedimentary sequences were formed of small depth. In the contact areas of the regional “arqueamentos” with the “troughs” of green rocks (south and southeastern sectors of the Oendolongo zone), volcanic activity occurred resulting into espelites, dactites, riolites, albitofires.

At the later stage of Early Proterozoic, phenomena of tectogenesis and of granite formation developed in the depressions and green rocks “troughs” as well as in regional “arqueamentos”. The orogenic activation resulted into a set of granitic intrusions, transforming the pre–existing crust into continental crust. The installation of the gabro–anortositic intrusions and of associated granites type rapaquivi shows maturity of the crust. The Early Proterozoic cycle lead to the formation of vulcano–plutonic structures in continental conditions.

At the Late Proterozoic cycle (1650 a 520 m.y.), formation of the coverage of the precambrian platform started. At the “aulacógeno” of Western Congo, in conditions of an epicontinental sea, impressive terrigenous e terrigenous–carbonated sequences of the Western Congo Supergroup were deposited. The main areas of denudation can be found at the eastern, western and southern sectors of the sedimentation basin. At the Early Rifean, in conditions of shallow waters, terrigenous–clay sequences of the Terreiro group were mainly deposited. During Middle to Late Rifean, a slow subsidence started which originated the accumulation of terrigenous–carbonated deposits with estromatolitic lime of Alto–Chiloango e Xisto–Lime Groups. At Late Rifean – Vendian a sedimentary elevation started to be formed, at the central part of the sedimentation basin, in which gross sediments started to settle into the M’Bridge formation. At the remaining basin reddish and gross deposits of terrigenous–lime nature accumulated, in orogenic conditions, at the M’Pioka and Inkisi formations.

Within the limits of the Congo plate, during Early Rifean–Vendian, the reddish clay–detritic deposits started to be formed (zone of Lucala, Xisto–Gressous Group). Middle Rifean give origin to the terrigenous–carbonated formations (zone of High Zambeze, Macondo Group). At the Okavango plate, during Middle Rifean, the reddish continental deposits formed, containing probably vulcanoclastic rocks (Humpata formation).

During Middle to Late Rifean, carbonatic deposits began to be formed, in conditions of an epicontinental sea (Chela Group, Leba Formation). The final stage of Late Proterozoic was characterised by the development of “dobramentos” and faults of the “aulacógeno” of Western Congo, as well as metamorfism of facies of green xists in some areas of the Congo plate. The structuration of faults of NE direction was accompanied by hidrothermal phenomena with mineralization of polimetalic copper. The activation period was responsible for the intrusions that penetrate into the consolitated and folded structures, resulting in the gabro–dioritic sienitic massifs, of alkaline and hiperalkaline granites, “mantos” and doleritic diques.

At the Late Paleozoic cycle (350–230 m.y.) the coverage of the platform went on. Into the depressions of Low Cunene, Lunda and in the graben of Cassanje, reddish terrigenous continental sediments were deposited (Lutoe Group, Ecca and the lower part of Cassanje Group).

At the Meso–Cenozoic cycle (230 m.y.) the coverage of the platform continued, in the inside of the continent as well as in its passive boundary. At the Precocious Triassic– Jurassic, on the plates of Congo and Okavango, clay–sandy deposits accumulated, in conditions of epicontinental or continental basins of shallow water (zones of High Zambeze, Cassanje and Dirico), as well as, very rarely, carbonaceous ones, finalising with lava of medium to basic composition conditioned by the activation of the platform (Higher Stromberg Group). At the Late Jurassic – Cretacic wide depressions were filled by heavy continental sequences that superimpose on the Karroo Supergroup (formations Continental Intercalar, Kwango and Calonda).

The beginning of the formation of the Perioceanic Depression must be dated at the Jurassic. Here, initially, great depressions in graben were created in zones of deep faults in which gross polimictic continental sediments of the High Jurassic and of the Inferior Cretacic were deposited (formations Maculungo, Cuvo, Lucula). In the zone of Cuanza, sedimentation was accompanied by vulcanic activity (complex of Jamba–Calunga). At the end of this period, probably in the barremian time, the continental conditions changed to marine conditions, starting the deposition of the terrigeno–carbonated sequences (formation Bucomazi and the upper part of formation Cuvo).

At the Apcian and Albian, in wide zones of the present terrestrial surface and of the continental platform were deposited evaporitic and salty carbonated sequences (formations Mavuma, Infra–Binga, Binga and Tuenza). At the Late Cretacic started the deposition of terrigeno–carbonated rocks in conditions of na open and calid sea (formations Pinda, Cabo Iedo, Vermelha, Itombe, N’Golome, Teba). In the Late Cretacic–Early Paleogenic started the formation of salty dommes and deep depressions.

At the Early Maestrichtian–Paleogenic, the conditions changed from transgressive to regressive, the last ones showing mainly after the end of the Eocenic, at the basin of Cabinda–Congo (formation

Malembo) and at the Oligocenic, at the zone of the basin of Cuanza (formation Quifangondo). The terrigeno–carbonated sedimentation became essentially terrigenous. An intense subsidence of the depressions continued, in which deep (until 3,000 m) terrigenous sequences deposited (clay, sand, limestone). On some sequences cenozoic turbidites were formed.

At the Mesozoic–Cenozoic, continental conditions dominated largely at the continental part of the territory of the country. At the Late Jurassic– Early Cretacic, the depression of Okavango was filled by reddish terrigenous deposits of the Intercalar Continental Formation. At the Late Cretacic, in alluvionar, alluvio–lakelike and lakelike conditions, the terrigenous sequences of formations Kwango and Calonda deposited on the Congo depression. The presence of carbonated material at the deposits of the formation Calonda probably testifies an ingression not very deep of the epicontinental basin of Zaire. The transition from the Early to Late Cretacic was characterised by the tectono–magmatic activation of the African platform which conditioned the wide installation of quimberlitic bodies, of alkaline ultrabasic rocks and carbonatites. These rocks are mainly located within the area of the transcontinental structure of Lucapa. It must be pointed out that, at the centre and at the eastern sector of Lucapa, the quimberlitic bodies are dominant and at the western sector and the centre are located massifs of alkaline rocks, alkaline ultrabasic rocks and carbonatites. At the zone of the deep Periocenic fault intrusive and effusive rocks of basic and acid composition were born at the Cretacic–Paleogenic.

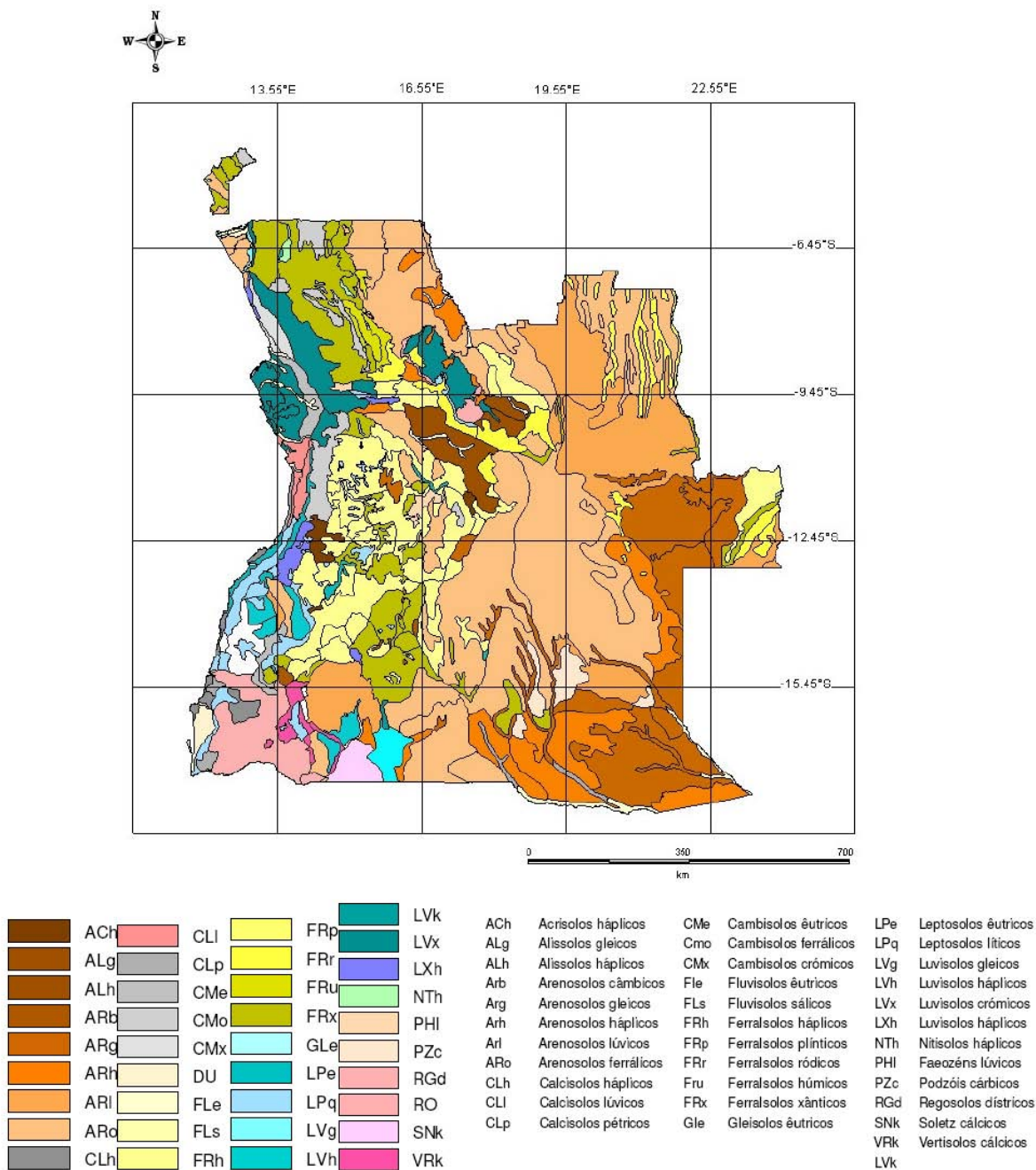
From the Paleogenic until nowadays the irregular risings of several parts of the territory went on shaping the present landforms. At the Paleocenic–Eocenic, in conditions of hot weather, alteration lateriticial cuirasses formed at several levels of the plains of the Late Cretacic. At the Eocenic–Neocenic, in wide plains of erosion belonging to the plains of the East of Angola, in conditions of arid climate, reddish deposits of the Kalahari Group began to settle. At that time the present hydrographic network started to be structured, its formation being completed at the Pliocenic. From the end of the Neogenic until nowadays, in conditions of wet climate, landforms related to erosion and accumulation go on developing.

3.6 - SOILS

According to MINAU (2006), there is a great diversity of soils in Angola. Because of their agricultural importance, the following soils have great representativity (Figure 3.5):

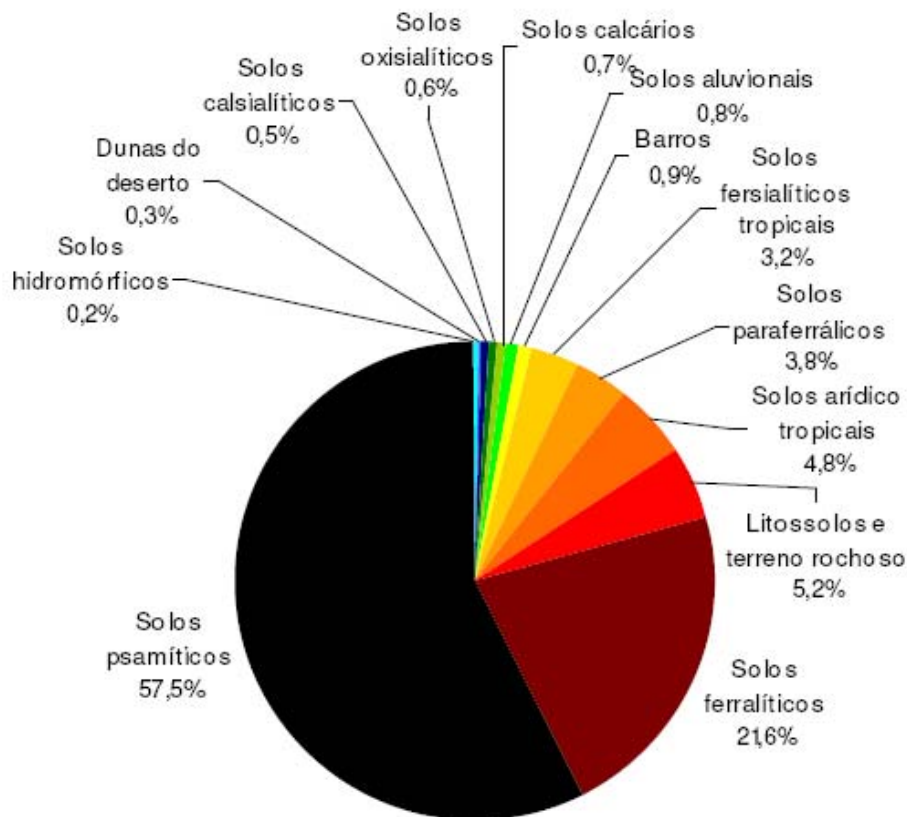
- Psammitic from humid and sub-humid regions;
- Ferralitic;
- Arid psammitic;

- Para-ferralitic;
- Fersialitic.



SOURCE: FAO(2006)

FIGURE 3.5
Angola Soils and Pedological Units Map



SOURCE: Diniz, 1998

FIGURE 3.6
Percentage of Pedological Units in Angola

PSAMMITIC SOILS FROM HUMID AND SUB-HUMID REGIONS

These soils cover most of the area of Moxico, a Lunda zone and the northern part of Kuando Kubango to the proximities of Mavinga. There are also some spots in the regions of Uíge and Zaire, in the provinces of Huíla, Kuando–Lubango and Kubando and in Lunda, associated with ferrlitic soils.

FERRALITIC SOILS

These soils are situated in the Central Plateau of Angola, from the north of Malange to the south of Huambo, covering the provinces of Huambo and Bié, east of South Kuanza and a portion that comprises Quilengues and Lubango. In the provinces of Lunda they emerge

associated with psammic and in Uíge and Zaire they are linked with fersialitic and paraferalitic soils.

ARIDIC PSAMMITIC

These soils appear in the southern strip of the Kuando Kubango province, from Mavinga to the Namibian borders. In some regions of Huíla, they are mixed with aridic non-psammic soils. They also emerge in Luanda and Muxima.

PARA-FERRALITIC

These soils appear in association with other types of soils, in the provinces of North and South Kwanzas, east of Malange and west of Lunda, Uíge, Zaire, Kuando Kubango and Southwestern Angola.

FERSIALITIC

These soils always appear in association with other soils and are located in North Cabinda, Uíge, Zaire, East of Malange, North Kwanza and Ambrizete and Caxito.

According to (Diniz, 1998) the arenosoils cover over 57% of Angolan territory and the ferrasoils occupy about 22%, as a consequence, infertile soils are largely dominant.

There are still some obstacles to agricultural production because, with the exception of some spots of alluvial soils, in river valleys and alluvial plains as well as some fractioning clays, along the coast and in the southwest part of the country there are soils, from arid and semi-arid regions, which have small thickness and a low humidity content (leptosols) or even too alkaline (calcisoils, gessoils and solonetz).

It is estimated that about 10% of Angolan soils have high agricultural potential, according to (IUCN, 1992). The luvisols, situated by the rivers, where alluvium is accumulated, are generally high in organic composts and mineral elements, the cambisoils, nitosoils and lixisoils that are to be found near the north-south transition belt, where the steep terrain prevents the development of eroded soils, in areas above basic rocks north of Malange.

The soils are poor in one or more essential nutrients to vegetal nutrition, and therefore, need correction. Nutrient loss due to water dragging from rains, watering erosion and plants' needs make the soils poorer during large periods, which has an impact over agricultural production.

According to MINAU (2006) the FAO holds soil deterioration, deforestation and agriculture as the main causes of the deterioration of Angolan soil.

In MINAU (2006) the cultivation without nutrient renovation and fertilizers, frequent burns, and consequent exposure to wind and rain are factors that contribute to soil deterioration in Angola.

3.7 - SURFACE WATER

3.7.1 - Main Hydrographic Basins

For a better understanding and framing of the hydrological and hydrogeological aspects to be studied, it is convenient to make a short analysis of the general characteristics of the basins in their varied features.

BASIN OF BENGO

The hydrographic basin of river Rio Bengo has a total area of about 11,100 km², develops dominantly East–West and has its mouth at about 45 km to the North of Luanda. Its higher stretches include successive rapids and the lower stretch has a very low slope, originating many lakes in their margins which work as basins for flow regularisation. Rainfall decreases gradually from upstream to downstream, where it is very low and variable.

BASIN OF CUANZA

Its total hydrographic basin has about 155,000 km², two thirds of which relate to the sub-plains region. In more than half of its course the river keeps at high levels, running towards North or Northwest; near Malange it turns westwards. Afterwards, during approximately 160 km, it goes down from the level 1000 m until levels close to the sea level. Its lower stretch runs from Cambambe downstream, with wide floodplains and large lakes at the margins. The geomorphologic characteristics of its upper stretch make its flow very beneficial for moderating the flow regime. Rainfall variation is similar to that of the basin of Bengo, being high upstream and decreasing slowly downstream.

BASIN OF QUEVE

With a total basin of about 23,000 km², river Queve is born in the central highlands zone and presents the same characteristics as river Cuanza: an initial stretch not very steep, an intermediate stretch with a high slope and a final plane stretch until the ocean. The rainfall variation follows a pattern also very similar to that of river Cuanza.

BASIN OF CUBANGO

Cubango is one of the three large international rivers at the South of Angola. It is born in the Bié highlands, near 1,800 m of altitude, runs more or less from North to South until it

reaches African Southwest where it turns eastwards and acts as a border; when it leaves the Angolan territory it crosses the “Caprivi Strip” and loses in a wide swamp – “Okavango Swamps”. The total area of the basin in Angola is 148,860 km² and its longitudinal profile does not show any relevant singularities. Rainfall decreases softly southwards following the climatic variation which passes from wet in the North to semi-arid at the south extreme.

The area of its hydrographic basin in Angola is equal to Cuito and Cubango itself. Cubango runs near the western edge of the basin and receives all its tributaries at the left bank, always oriented from North to South, their courses being parallel and at a short distance from each other. This characteristic alters when Cubango enters widely into the sedimentary zone in the South. Cuito, although being more branched upstream, has no more important tributaries downstream river Longa, at its right bank. Orography and geology influence strongly the physiography of several watercourses. While all the rivers to West of the Cuito present rocky beds, important slopes and are stable, rivers to the East tend to have meanders, are unstable and with very small slopes. More specifically, river Cubango, running on a rocky bed until river Caiundo, is more stable downstream; only at the international stretch, more exactly after Sambio, starts to follow a meander pattern, with floodplains wider and wider and even with lakes at the margins. Notwithstanding rainfall pattern, excepting some small tributaries in the south zone, all watercourses in this basin have permanent flows, those located at the sedimentary formations having a remarkable regularity of flows.

Vegetation distribution is more or less uniform in the whole basin, varying from the savanna type to the forest more or less closed. This one is located at the upper part where, due to the higher rainfall, flora is quite rich and varied and trees have bigger size. Savanna develops in a restricted area along river Cuito and some of its tributaries. In the southern zones of this basin, spots of vegetation including bushes can be found among the scattered trees.

BASIN OF CUNENE

The basin of Cunene covers a total area of 106,500 km². The river is born in the high plains and runs more or less from North to South until it reaches the region of Namibia in Ruacaná. Here it turns westwards to the ocean and acts as a border. After an initial stretch until Matala relatively steep, the river crosses a plane with wide floodplains until a little upstream of Ruacaná, where, in successive rapids and waterfalls, goes down from levels of 1090 m until near the sea level. At its final stretch, near the mouth, the river crosses the Namibe desert. After two heavy rainy centres, one at the north extreme, the other at Northwest, it follows a gradual decrease of rainfall to South and West.

The hydrographic basin of river Cunene is covered by sediments of the Kalahari, being characterised by great scarcity of permanent surface water, excepting the water accumulated during the rainy season in some natural depressions or in excavated deposits, where it remains available during variable time periods.

The hydrological and hydrogeological phenomena are characterised for being extremely variable, both in space and in time, their interpretation and study so requiring the collection of the biggest possible number of elements for the whole relevant area and for a period as long as possible.

To analyse these phenomena certain time intervals must be considered according to the specific studies to be carried out. However, the majority of the hydrological phenomena are interrelated in a chain form, which means that some phenomena result from others, preventing to take them isolated.

However, because periodicity requires division of time, it may be logical to fix the hydrological year according to the climatic conditions of the region under study, being usual to consider its beginning at the time the surface and underground water reserves in the hydrographic basins are at their minimum. The hydrological year will be defined between the end of two consecutive dry seasons and so it is reasonable to conclude that, in fact, besides its beginning being variable from region to region, it will also be variable from year to year in the same region. However, the need to elaborate, process and compare hydrological elements leads to the consideration of a fixed date for its beginning for each region. Also by practical reasons the hydrological year shall start at the first day of a chosen month, as above referred to, in order that the water reserves are the minimum, which means practically the end of the dry season, which in Angola is usually between September and November.

3.7.1.1 - Main watercourses

The Zaire river (located in the northern and north-eastern regions, with mouth in the Atlantic Ocean) and the Zambeze river (located in the eastern and south-eastern regions, with mouth in the Indian Ocean) are the main water lines of the PRA; together with the Kunene and Kubango rivers (in the southern part of the countries, with mouth in the Atlantic Ocean and the Indian Ocean, respectively) they form the great international rivers of Angola.

The central plateau is crossed by main fluvial systems that run south – Kunene and Kubango – or West, towards the coast – Qwanza. Along the coast, some small rivers have developed and are of great importance to the subsistence of the local communities.

The hydrographical basins of the Zaire and Zambeze rivers include several wetlands, namely springs in High Kwanza (Luena), swamps and lakes in High and Mid Kwanza and springs and swamps in Zambeze. There are also large swampy areas along the Cuando river, the Cubango river and several sections of the Zaire river and humid areas in the central plateau (north of Huambo–Kuito) and in the SE region.

The terminal sections of the Zaire and the Kwanza rivers, in an extension of several dozens of kilometres, that includes strips of mangroves – which occupy about 240 km² of the country's coastal areas (MINUA, 2002) – and are extremely important to the settlement of several aquatic species (specifically crustacean, fish, shellfish) and margin stabilization.

Especially in the south and southeast of the country, the driest parts, the water lines are irregular and depend on the wet season's rains, originating sandbanks in the mouth in some cases.

The hydrographical network of the Kubango river forms the Okavango delta, with great economic and ecological significance, and the Kunene river, which crosses an half-arid zone, is the only permanent water line in the north-western limit of Namibia.

3.7.1.2 - Water Resources

Angola is a country of high hydric resources potential, with an estimated annual superficial flow of 140 million of m³, that is, 140 km³/year (MINUA, 2004).

The hydrographical basins of the Zaire and Zambeze rivers, develop in high rainfall areas more than 50% of their flows depend of rains that take place in upstream countries (MINUA, 2006).

3.7.2 - Underground Water

The subterranean hydric resources in Angola are subjacent to several groups of aquifers, in the coast (with an average depth between 5 and 30 m), in the central plateau region (with an average depth between 10 and 30 m) and in the half-arid zones of the Kunene (with an average depth of 300 m or more). There are also diverse mineral water springs but information on this subject is scarce.

The annual availabilities of subterranean waters are estimated to be of 58 km³/years (FAO / Aquastat, 1995).

3.7.3 - Water Use

Despite of the high hydric resources potential available in Angola, they are still exploited below their potential.

3.7.3.1 - Main Dams

Table 3.1 shows the main dams and some of their features. Out of these 13 dams, seven are entirely dedicated to hydroelectricity production and one to irrigation; the five remaining have multiple purposes (including water control in four of them).

TABLE 3.1
Main Dams in Angola

DAM	PROVINCE	ALTITUDE (m)	PURPOSE
Quiminha	Bengo	42	Water control, irrigation and electric power
Biópio	Benguela	13	Electric power
Lomaum	Benguela	15	Electric power
Cambambe	Malange	88	Electric power
Cunje I	Bié		Electric power
Calueque	Kunene		Irrigation
Gove	Huambo	58	Water control, irrigation and electric power
Matala	Huila	20	Electric power and irrigation
Mabubas	Bengo	40	Electric power
Luachinho	North Lunda	8	Electric power
Capanda	Malange	110	Water control, irrigation and electric power
Candjelas	Huila	30	Water control and irrigation
Chicapa	South Lunda	16	Electric power

SOURCE: MINEA (2004)

3.7.3.2 - Water Supply to Population

This type of infrastructure is estimated to cover about 50 or 60% of the population, according to different sources, with almost 60% of water-supplied population living in the city of Luanda (MINEA, 2004).

The majority of urban population is not served by the national network but by water tanks, whose water is not treated or is obtained in polluted sources, near patent concrete cesspits or absorbing wells (MINUA, 2006).

For water supply, in cities and inland suburban and rural areas, population turns to underground water sources, more than a million wells scattered by all provinces (MINEA); in the southern provinces, the driest ones, even accumulated rainwater is used, also to water the cattle.

3.7.3.3 - Fluvial Fishing

The country is rich in freshwater fish (with some endemic species), mainly in the regions of the Zaire, the Zambeze and the Kunene (especially in the western zone of the basin) and the Kubango–Okavango rivers.

The highest priced species are the small fish such as the “cacusso”, the “bagre” and the “cabuenha”, which can be found in the irregular floodable areas of High Kwanza.

Although captures have strongly decreased after the country’s independence, fishing in inland waters are still essential to population nutrition.

3.7.4 - Water Pollution

3.7.4.1 - Human Occupation

Due to war and emigration and immigration phenomena, the last decades have seen major significant changes to population distribution numbers in the country, and therefore, there is a great disparity between statistics.

In 1975, about 80% of the population lived in rural areas and about 90% lived in the western “half” of the territory, with Luanda counting about 500,000 inhabitants; at the beginning of the 90’s decade, 60% of the estimated total population of 10.7 million inhabitants lived in rural areas. During that decade, though, there were strong population migrations from inland to coastal areas (mainly to Luanda, Benguela and Bengo). As a result, some sources estimate that out of a total of 16.5 million inhabitants, about 4 million live in Luanda (24.2% of the total).

Besides, in main cities, urban wastewater systems are obsolete or down due to the lack of maintenance, and consequently important untreated sewage discharges take place in urban areas.

3.7.4.2 - Cattle Breeding Activity

Besides heads of other species, statistics from 2005 count about 4 million bovine heads and 2.5 million of swine heads in the entire country (MINADER, 2005).

The bovine cattle is mainly scattered by the provinces of Huíla (with 1,380,000) and Cunene (with 1,345,000) – which form about 2/3 of the country’s totals – as well as by the provinces of Namibe (with 402,500), Benguela (with 310,780), Kuando Kubando (with 295,550) and South Kwanza (with 115,000).

Swine are mainly scattered by the provinces of Huambo (with 597,000) and Benguela (with 332,400) – that represent 40% of country's total heads – followed by the provinces of Huíla and Cunene (with 246,100 each), Bié (with 245,600), South Kwanza (with 197,200), Kuando Kubango (with 157,500) and Malanje (with 150,400).

3.7.4.3 - Agricultural Activities

Commercial agriculture is scattered by the provinces of Cabinda and Luanda, in the coastal north, and by the provinces of Namibe, Huíla, Benguela and Huambo, in the south-western part of the country. In the latter provinces, large irrigated zones can be found.

The type of used fertiliser varies from place to place: in the north-eastern “half” of the country – except Malange and North Qwanza – green manures are predominantly used, in the south-western “half”, dung is more used and in the provinces of Luanda and South Qwanza organic compost is used by the majority.

The low incidence of diseases and/or plagues indicates that the numbers concerning the use of fitopharmaceutical products are irrelevant.

3.7.4.4 - Recreational Activities

Because of the presence of hostile animals (such as crocodiles), the water lines in Angola are not suitable to this kind of activity.

3.7.4.5 - Other Activities

The oil industry is one of the responsible for water pollution – namely through polycyclic aromatic hydrocarbons – through either dragging oil spills to surface waters or infiltrating into undergroundwaters or aquifer contamination where tanks were burned during the hostilities. The true intensity and extension of the pollution is yet unknown.

The inadequate management of solid waste in residential zones, especially in larger cities like Luanda and their suburbs, is another source of water pollution – with high risks to public health and to the environment - because of either inadequate behaviour of the population or insufficient human and material resources, unrestrained urbanization and transportation network difficulties or even dumping sites (in case of Luanda, followed by open air burnings and dumping waste in soils without protective covering or, in case of the provinces of Cabinda and Benguela, waste is dumped in swampy areas). In addition, the management of hospital wastes, especially dangerous wastes, is poor.

The car vehicles circulation, which has registered a significant increase over the last years, can also be an important source of deterioration of hydric masses near densely populated urban areas (namely materials in suspension, organic composts and several heavy metals).

3.8 - ECOLOGICAL ASPECTS

The great diversity of biomes and ecosystems one can find in Angola is unique among African countries. The word BIOME concerns an extended biogeographic region that is defined by the genetic composition and the origin of plants and animals as well as physiognomic, climateric and edaphic factors.

A biome consists in several ECOSYSTEMS. The word ecosystem refers to a particular community of animals and plants, associated with their physical environment.

The in-depth study of Angolan ecosystems is still inexistent, and therefore, this document follows the classification by Brian Huntley (1992), that is based on brief references found in Angola's biogeographic characteristics studies (Chapin 1932, Traylor 1963, Barbosa 1970, Huntley 1974, White 1983).

According to Huntley (1974) and White (1983), who, among the “regional endemic centres”, offer the best synthesis of the biological characteristics of Angola, the main regions and percentages in the national territory are:

- Guineo-congolense 10,7% (Forest, wild jungle, savannas of high grass)
- Zambeziac 86,2% (Woods, savannas, meadows e wild jungle)
- Afromountain 0,5% (Forests, savannas and meadows)
- Karoo-Namibe 2,6% (Desert, bushes, savannas, woods, wild jungle)

3.8.1 - Areas of Ecological Interest

The large extension of the national territory, the low population density and the great diversity of biomes and ecosystems are all factors that would allow Angola to possess a significant protected areas' network. However, this does not happen, mainly due to its colonial history. It has never been a concern of the Portuguese Government to environmentally preserve its colonial territories, which were merely regarded as a source of raw materials, to be soon exploited. Only a small group of Angolan inhabitants was determined to fight for the environmental protection of their territory. The creation of environmentally protected areas happened as a result of the international public opinion, which pressed colonially occupied territories to create environmental protection areas

There are officially six National Parks, an Integral Natural Reserve, a Partial Reserve and a Regional Park, which express an initial rating that needs alterations:

• Iona National Park	15,920 km ²
• Cameia National Park.....	14,000 km ²
• Quiçama National Park.....	9,960 km ²
• Luando Integral National Reserve.....	8,280 km ²
• Bicuari National Park	7,900 km ²
• Mupa National Park.....	6,600 km ²
• Namibe Partial Reserve	4,680 km ²
• Cangandala National Park	600 km ²
• Chimalavera Regional Park.....	160 km ²

Since 1975, a redefinition of these protection areas, together with the creation of new ones, have been recommended, as a means of preserving samples of several biomes and ecosystems within the national territory. These proposals include areas of sightseeing interest, natural monuments, swamps and mangroves.

3.8.2 - Fauna

The diversity of Angolan fauna was subject to more studies than its botanical resources, especially the vertebrate animals. The rich bird fauna was categorised by Traylor (1963) and complemented by Dean (1988), but the most comprehensive study was done by Pinto (1983).

The fish species in the numerous Angolan rivers were partially categorised by Max Pohl (1967), but, until today, no other studies have been made on that subject.

The reptiles and the amphibians need further field research.

The Angolan mammals have been in fact the most studied animals in field. Of all of them, the Palanca Real was by far the one studied in more detail, by a two-year project in Luando (1969/1970).

Studies on taxonomy and species' distribution synthesis were publicised by Crawford Cabral (1988).

From 1971 to 1975, a comprehensive status report of 80 species of mammals was made by the ecologist Brian Huntley. Those days, few areas had plenty of animals, but protected areas were experiencing a great development. Since 1975, most animals, even these ones, have been decimated

by unrestrained hunts. The killing of elephants, rhinos, gungas, brown palancas, guelengues, “cabras de leque”, zebras, small antelopes and many other species took place in protected areas, due to the lack of conservation services, whose workers were forced to leave because of the lack of safety and means of survival.

Only small species with no nutritional or cinegetic value survived, and took advantage of the abandoned agricultural fields and mines.

3.8.3 - Flora

The most common physiognomic type of vegetation in Angola is represented by the “Miombo” woods, which cover about 50% of the country. They are mostly associated with the sandy regions of the Kalahari and the entire inland plateau.

In semi-arid regions and on those from the provinces of Cuando Cubango, Cunene and Huíla covered by sand, there are vast areas of woods and wild jungle, which consist in *Pterocarpus angolensis*, *Albizia* spp., and *Burkea africana*. In the drier and rocky regions of the western Cunene and the eastern Namibe the composition is of *Comiphora* spp., *Terminalia* spp., *Colophospermum* spp., *Boscia* spp. and *Combretum* spp., with a layer of annual graminea.

The meadows can be found in small altitude areas of the inland plateau, in the provinces of Huambo, Bié, South Kwanza and Huíla, associated with scarcely drained soils. The most common plant species are the *Parinari* spp., *Protea* spp., *Myrsine* spp., *Dissotis* spp., *Phillipia* spp. and the *Loudetia* spp.

In the eastern region of Moxico there is a large area of little scarcely meadows, with dozens of kilometres, that follow water lines, where the *Loudetia simplex*, *Trystachia* spp., and the *Eragrostis* spp. can be found.

In the north-eastern regions of the Lundas, the meadows are located in the higher spots and forests occupy the places by the rivers.

The wild jungle bushes are common all over the country. In coastal areas, they occur associated with savannas and *Adansonia* spp. and *Sterculia* spp. woods. In these xerophytes’ formations we can also find *Strychos* spp., *Combretum* spp. and *Dichrostachys* spp.

In arid and semi-arid regions of the Southwest of Angola the *Acacia* spp., *Colophospermum* spp., *Terminalia* spp., *Boscia* spp. and the *Dichrostachys* spp. emerge.

Although relatively small, the areas of marshy vegetation have a crucial ecological importance. They appear in alluvium plains of the largest rivers in Angola, such as Kwanza, Kuando, Kubango and Cunene. Along the coast, in rivers' estuaries facing the Atlantic, mangrove fields appear.

3.9 - AIR QUALITY

3.9.1 - Introduction

Air pollution is one of the most serious issues in the global scheme, and is the result of the presence in the air of undesirable substances in such concentrations that can cause damaging effects, concerning the greenhouse effect and the ozone layer.

Although the composition of the atmosphere can be altered by natural causes (such as smoke, ashes and gases expelled by volcanoes or forest fires, for instance), it cannot be denied that human activities, especially the combustion of fossil fuels, the increasingly high usage of motorised vehicles and the urban development, have been the main polluters, by releasing tiny particles of CO, CO₂, SO₂, NO_x, among others, into the atmosphere.

The consequences of air pollution, from toxicological to economic, are numerous and various. Materials, plants, animals and people altogether can be, directly or indirectly, harmed by the contaminators.

3.9.2 - Air Quality in Angola

According to MINUA (2006), the main centres of economic attractiveness are starting to present indicators of productive dynamism, and therefore, population density, and most times, high pollution levels, as a consequence of the growing number of motorised vehicles and industrial sources.

At the same time, there are other focuses of polluting particles' emission, mainly as a consequence of combustion of solid waste, power generators and oil production.

It is estimated that carbon dioxide (CO₂) and methane (CH₄) are the most polluting gases. Among the gases with the most severe effects on human health are the nitrogen oxides (NO_x), the carbon monoxide (CO), the sulphur dioxide (SO₂) and small dimension particles in suspension (PM₁₀).

The emission of Particles in Suspension is connected with non-macadamised roads, desert terrains, long dry seasons, circulating vehicles and industries without gas emission regulations.

Other equally important polluters in Angola are, because it is an oil producing country, aromatic polycyclic hydrocarbons, existing mainly in areas with oil plants and refineries.

Several investigations by the World Health Organisation, the United Nations Environmental Programme and the World Bank, demonstrated that these polluters may have a damaging effect on health, mainly by causing breathing diseases, who affect mostly urban population.

In order to assess the air quality in Angola, is necessary to implement an air quality monitoring plan, with measurement stations strategically placed throughout the country, so as to establish criteria and limits to maximum, average and minimum concentration levels that the different polluter can reach in the atmosphere and to human activities in a specific place, and, based on this data, promote the territorial management and planning.

3.9.3 - Description of Main Air Pollution Sources in Angola

Although Angola does not have an air quality monitoring network, it can be assumed that gas emissions from the combustion of fossil fuels are dominant, due to:

- Circulating vehicles;
- Power supply generators;
- Oil production torches, and
- Forest burnings.

From the sources mentioned above, the motorised vehicles, predominantly in large urban centres, are responsible for most of carbon monoxide and volatile organic composts emissions into the atmosphere, once they have grown in numbers over the last few years, for both personal and commercial uses. The emission of particles and dust (PM₁₀), which is directly linked to these sources, has also increased, especially in scenarios where roads are in poor condition.

In addition, the massive occupation of residential areas near main communication routes and urban centre connections exposes great part of the population to these polluters.

Other source of air pollution is the use of electrical generators, particularly in large residential areas, where there is no connection to the electrical power network or the existing supply is irregular. The industry uses this power source as well, in order to meet production deadlines. Not only is air pollution a direct consequence of this behaviour, but also noise levels, which are raised by generators.

Like generators, the combustion of fossil fuels occurs in oil production centres, which are responsible for greenhouse effect gases in about 60 plants. Presently, the Angolan Government is investing in the reduction of gases emission.

Finally, biomass combustions occur mainly during the dry season, as a means of obtaining coal for cooking, producing heat and for agricultural and cattle raising purposes.

The biomass combustion results in the emission of carbon monoxide (CO), nitrogen oxides (NO_x), nitrous oxide (N₂O), methane, non-methanic hydrocarbons (CH₄) and particles, besides carbon dioxide (CO₂).

3.10 - NOISE

3.10.1 - General Comments

Noise can be seen as one of the main factors that influence the environment and contribute to the living standards. The problems associated with noise are often the result of irresponsible uses of common areas or adjacent zones. The key to effectively solve these problems is an integrated approach, highly articulated with territorial planning and public space management.

Pollution is considered to be one of the most severe forms of harm to both men and environment. According to WHO – World Health Organization, the human ears should not experience audio stimuli louder than 65 dB (A). Surpassing this limit may increase the risk of developing:

- Insomnia (sleeping problems);
- Depression;
- Hearing loss;
- Aggressiveness;
- Concentration or attention loss;
- Memory loss;
- Headaches;
- High blood pressure;
- Fatigue;
- Gastritis e ulcers;
- Drop in working or learning efficiency;
- Deafness (if exposed to extremely loud noises).

The longer the exposure to loud noises lasts and/or the higher the sound pressure is, the higher will be the risks to human health. The hearing loss, one of the most common effects of noise overload, can be caused by several activities in one's daily routine.

This situation can be avoided by existing sound proof technologies, which involve the development of specific products, resources to recognise and analyse noise sources, simulation programmes to help predict the results of a noise reduction and noiseless equipment.

Considering the environmental impacts caused by the alteration of referential acoustic patterns, they must be considered dangerous only when they affect the living standards of the population. In other words, when the establishment of a new source is felt by a sensitive receptor.

In general, when establishing a new sound source, it may be required that not only preventive measures are implemented and an adequate location considered, but also corrective policies about different forms of insonorization executed. As a result, a balanced sound environment is preserved by defining noise pollution limits.

3.10.2 - Description of Referential Acoustic Patterns

While working on the Relatório do Estado Geral do Ambiente (MINUA – 2006), some acoustic studies took place in Luanda and Cabinda. These were intended to illustrate the referential acoustic patterns in specific areas, such as residential, industrial, commercial and intense car traffic zones.

The acoustic studies focused on two referential periods; a day-time period from 06.00 a.m. to 06.00 p.m. and a night-time period from 06.00 p.m. to 06.00 a.m.

When analysing the acoustic studies was observed that L_{Aeq} (level of permanent equivalent sound pressure, discussed in A – ISO 1996–1:1982) levels in commercial areas and in zones near main highways were over 70 d (A), during day-time.

In residential areas, during day-time, the L_{Aeq} reached 50 dB(A), approximately.

The night-time observations witnessed a significant decrease in L_{Aeq} levels in commercial areas and in zones near main highways. Generally, measurements revealed levels that varied from 30 dB(A) to 50 dB(A).

Although the previously mentioned studies refer to a tiny proportion of the real referential acoustic pattern, it is possible to assess the general quality of the sound environment in two main components – community or neighbourhood’s noises, which are due to community’s multiple daily activities, and noises from other sources, like industries and transportation infrastructures. As an example, Graph 1 shows common L_{Aeq} referential values in different situations under the influence of different sources.

The quality of sound environment is reflected in rural areas, where few noises are originated by large focus of urban activity and transportation infrastructures.

Still according to the Relatório do Estado Geral do Ambiente (MINUA – 2006), to analyse the population's complaints about noise pollution, some interviews have been made not only in Luanda but also in some other provinces.

From all the interviews, the main complaints were connected with the loud noise generated by air and car traffic, as well as by commercial areas. In general, people enquired expressed their concern about the quality of their living standards and the environment they live in. A significant proportion of those surveyed are not bothered as they are unaware of the actual danger it represents to their health. This is the reason why civic activities for environmental education should be encouraged: to teach population how to deal with noise pollution issues.

The little available data subject to analyses reflects the increase of noise pollution in Angola that has been taking place for the last few years.

3.10.3 - Legal Background

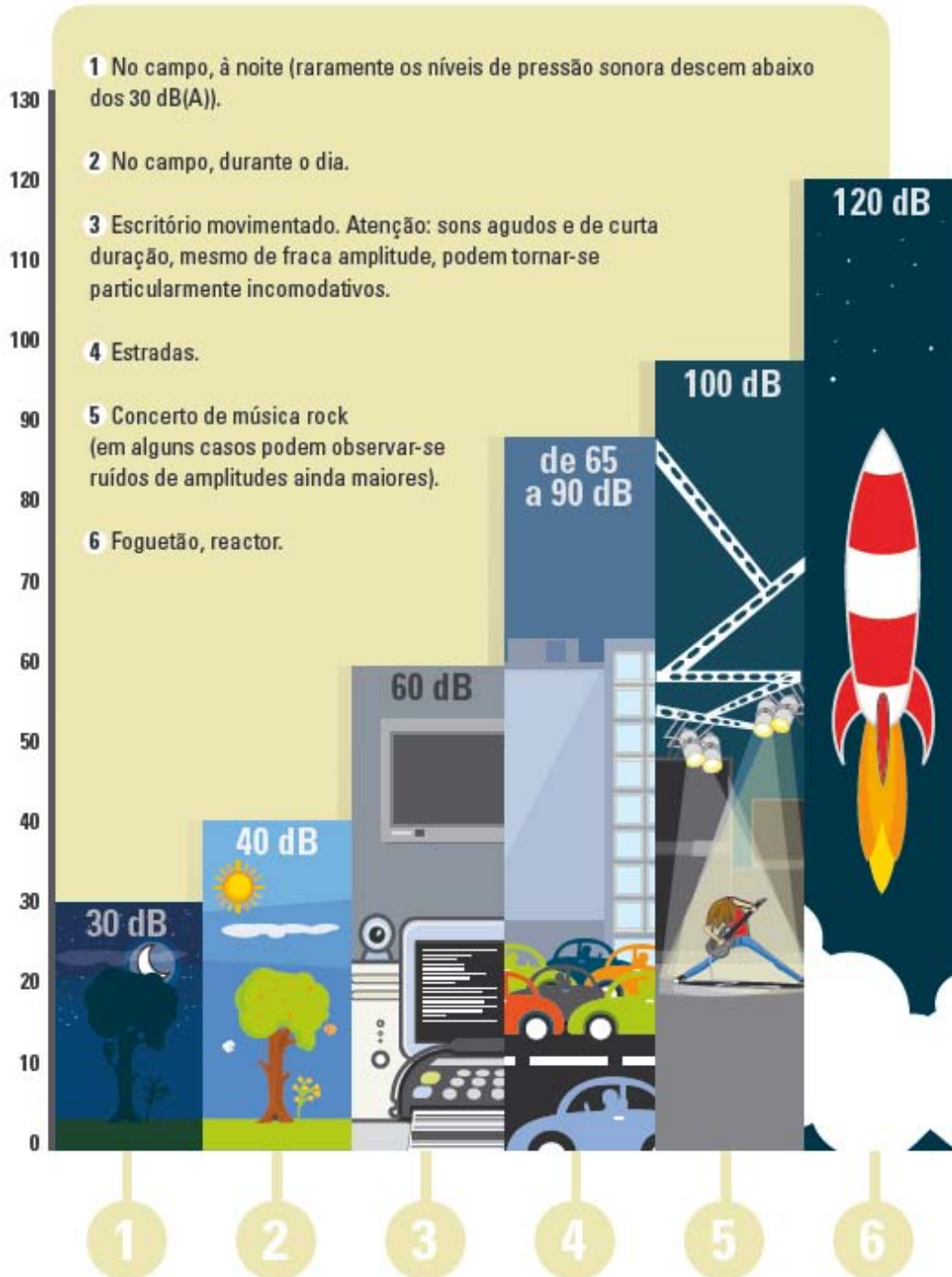
Angola does not have defined regulations in terms of noise pollution. Nevertheless, the Lei de Bases do Ambiente mentions the establishment of environmental quality patterns in urban and non-urban areas considering noise pollution.

The only existing legal restrictions in Angola are established by the Convenção sobre Aviação Civil Internacional, which produced the Norma de Certificação do Ruído de Aeronaves. The aeronautical entity responsible for the respect for of national legislation and international agreements is the Instituto Nacional da Aviação Civil (INAVIC).

Angolan airports are usually located near residential areas and main transportation routes.

The number of flights and vehicles has been growing permanently, in tune with the current economic development. The increased number of vehicles is the main reason why intense traffic and traffic jams have become more frequent. The abundant works, together with the use of power generators, have made the noise problems far more difficult to solve.

Finding the solution to some noise problems requires effective legal regulations that not only punish the polluters but also educate the population, showing how dangerous noise can be to the population's health.



GRAPH 1
L_{Aeq} Referential Values

3.11 - SOCIAL AND ECONOMIC ASPECTS

3.11.1 - Demographics

Finding reliable information on Angolan demographics is a difficult task since the different sources never agree on total population or on its geographical distribution.

The last population census in Angola dates back to 1970, when inhabitants were estimated to be about 5.6 million, associated with a population density of 4.5 inhabitants per square kilometre. The results were regarded with apprehension and there was widespread criticism of the methods employed and the limitations caused by the conflicts in several regions of the country.

In 1975, when Angola became independent, the population was estimated in few more than 6 millions, about 80% of which lived in rural areas. Luanda must have been populated by close to 500 thousand inhabitants and only two other cities exceeded 100 thousand inhabitants (Huambo and Lobito). The huge spatial unbalance was expressed by the fact that 90% of the population lived west of a meridian in the longitude of Camacupa (where the geodesic centre of Angola is located), revealing a virtually uninhabited eastern region.

From then on, Angolan demographics have suffered significant alterations, namely:

- Hundreds of thousand people leaving the country (Portuguese in their overwhelming majority) to countries like Portugal, South Africa, Brazil and Zaire (now Democratic Republic of Congo) among others;
- Angolans returning to their home country after years in bordering countries, mainly Zaire;
- Rural population migrating to cities to look for safety and better living standard.

In the beginning of the 90's decade, a period of peace when the first elections took place, Angolan population was estimated to be around 10.7 millions (Monografia de Angola, 2001), about 60% of which lived in rural areas.

According to the Monografia above, the demographic growth rate during the 90's decade must have been 3.8% and population reached 14.6 millions in 2000, with 52.1% of young people aged less than 17.

Throughout that decade, due to the increasingly high intensity of the conflicts, a massive migration of people from inland to coastal areas took place, with Luanda, Benguela and Bengo being the cities that, proportionally, hosted more population, and therefore, raised the percentage of urban population.

Using Monografia de Angola and a non-official projection used by Instituto Nacional de Estatística (INE) and Ministério do Planeamento, it was possible to present the following hypothetical table (Table 3.2) of the population evolution, including a projection for 2010¹.

TABLE 3.2
Population evolution

PROVINCE \ YEAR	1990 (Monografia)	2000 (Monografia)	2000 (INE)	2005 (INE)	2007 (INE)	2010 (INE)
Bengo	65,200	384,111	214,000	247,000	285,000	288,000
Benguela	643,000	1,614,883	810,000	941,000	1,000,000	1,094,000
Bié	1,060,900	1,095,813	1,440,000	1,674,000	1,776,000	1,944,000
Cabinda	161,500	207,628	223,000	261,000	279,000	303,000
Huambo	1,522,200	1,598,424	1,945,000	2,261,000	2,403,000	2,628,000
Huíla	868,000	1,225,004	1,079,000	1,252,000	1,329,000	1,455,000
K.Kubango	128,500	385,265	156,000	181,000	193,000	210,000
Kwanza Norte	376,700	403,721	495,000	576,000	611,000	687,000
Kwanza Sul	649,700	807,441	800,000	928,000	98,000	1,079,000
Kunene	228,400	406,028	287,000	335,000	354,000	387,000
Luanda	1,526,900	2,824,891	2,276,000	2,643,000	2,807,000	3,072,000
Lunda Norte	290,700	403,721	359,000	418,000	445,000	488,000
Lunda Sul	154,000	451,014	187,000	215,000	229,000	252,000
Malanje	890,500	855,888	1,148,000	1,332,000	1,417,000	1,550,000
Moxico	315,100	387,572	404,000	469,000	502,000	549,000
Namibe	114,100	275,684	172,000	199,000	213,000	232,000
Uíje	835,300	986,232	1,111,000	1,286,000	1,367,000	1,495,000
Zaire	191,300	288,372	294,000	344,000	384,000	399,000
Total	10,022,000	14,601,692	13,400,000	15,562,000	16,541,000	18,092,000

SOURCES: Monografia de Angola, 2001; Projecção Demográfica não oficial utilizada pelo INE

The values above are doubtful for they vary significantly from source to source. As you can see, the figures collected by Monografia de Angola of 2001 differ greatly from those of INE. These statistics report 2.8 millions of inhabitants in Luanda in 2007, whereas every studies points out to at least 4 millions. From consulting other sources, such the Ministério da Agricultura e Desenvolvimento Rural/FAO, the Ministério da Saúde/Organização Mundial da Saúde/UNICEF and the

¹ References to INE do not compromise this institution as the table above is merely a reference used in planning exercises and was not officially adopted.

Governos Provinciais, identical situations happen. UNICEF, for instance, states the existence of 18,175,692 Angolans in 2006. All sources are aware that data should not be considered trustworthy.

Considering this situation, it is difficult to comment on other indicators. All things considered, it can be said that the current growth rate must be around 3%, population aged less than 18 corresponds to 56%, women perhaps represent 51% of total population and that there is a balance between the number of rural inhabitants and of those living in urban centres and their suburbs.

3.11.2 - Economic Activities

Angola has been experiencing a great economic growth in the last few years due to the cumulative effect of three factors:

- Dividends of peace;
- Increase of production and oil prices in the global market;
- Better performance of the non-oil sectors of economy.

The end of the war allowed the free circulation of goods and people, the rehabilitation of economic and social infrastructures and the restoration of hope and trust among Angolan people.

The oil sector is still largely dominant, having reached a total production of over 515 millions of barrels, with an average daily production of 1.4 millions of barrels sold for more than 45 dollars per barrel, estimated as a forecast for 2006. Oil represents 57.1% of Growth National Product (GNP) and more than 80% of fiscal revenues².

Although the oil sector is still a sheer weight in economy, the recovery of the non-oil sector is a fact vindicated by a permanent increase in diamonds extraction (with an average annual growth rate of 12.4%), while agriculture, fishing, transformer industry, power, water, construction and services are growing at a global average annual rate of 10.1%.

The GNP in 2006 reached almost 41 thousand million dollars, which corresponds to an increase of 18.6% (against 20.6% in 2005). The GNP per capita, a synthetical indicator of the population living standard, was 2,565.2 dollars in the same period (against 1,984.8 in 2005 and 1,265 in 2004).

Even though there is a strong discrepancy in the distribution of national wealth, it is legitimate to believe that the poverty index (68% in 2000 as in the last Inquérito às Despesas e Receitas Familiares) has decreased, mainly because better economy and increased investments reduced

² Almost all mentioned figures were taken from Balanço do Programa do Governo de 2006 (April 2007).

unemployment. According to Balanço do Programa Geral do Governo de 2006, the unemployment rate can have been reduced to 25.2% (29.2% in 2005) and the real growth of average income of Angolans reached 15.3% (17% in 2005) considering a demographical growth rate of 2.9%.

Other indicators of Angola's present economic situation may justify or be a result of the economic growth. Public investment in 2006 was estimated to be 1.5 million dollars (a 76.5% increase as in 2005 it reached 850 million); private investment was of 11.4 thousand million dollars; the cumulative inflation rate in December 2006 was of 12% (16% in 2005); bank credit to the private sector increased 102%, approximately. The implementation of the Programa de Investimentos Públicos –

– from which the social sectors benefited in 28.3% – resulted in an improvement of population welfare, with emphasis to Housing, Community Services, Health and Education and allows the creation of structural conditions to the recovery of non-mineral production.

Nevertheless, this optimistic overview should not exclude a careful critical analysis of agriculture, the economic activity that uses most workforce. In fact, the contribution of the agricultural sector to GNP is measured essentially from family production; which is obviously dominant in terms of total production, however, it is still informal, making the calculation of its indicators based in statistics, which may include large errors.

The best example is in the considered number of family farmers – about 2.2 millions – that is hard to accept if we consider the existence of 16 millions of Angolans and a relative balance between urban and rural population³. Since the agricultural production estimates are based on statistics than contain massive errors, it is legitimate to question overall production. Besides that, the investment in family agricultural production – in both extension and investment – is still minimal and not as lucrative as investments in other agricultural activities, such as irrigated fields or large plantations created by public-private partnerships, which offer a much more positive response⁴.

³ If there were 2.2 millions of family farmers and an actual balance between urban and rural population, Angola would currently count close to 22 millions of inhabitants of which 11 lived in the countryside (considering that each family consists in a group of 5 people, which is believed to be a conservative number due to war orphans that must have been integrated in families), numbers that exceed those of known statistics.

⁴ According to Balanço do Programa do Governo, 6% of the Programas de Investimentos Públicos (71 million dollars) in agriculture to 2006 was used in irrigated perimeters that do not help family farmers. The Programa de Extensão Rural, which is oriented towards the needs of these farmers, was only granted 30 million dollars in 2005 and 2006.

TABLE 3.3
National accountability aggregates

(thousand USD)

ECONOMIC SECTORS	2004	2005	2006
Agriculture, forests, animal husbandry and fishing	1,708,872.9	2,602,745.5	3,207,010.9
Oil and refined products	9,855,596.3	17,038,903.1	23,382,668.5
Diamonds and others	716,615.5	884,694.8	950,666.3
Manufacturing industry	792,086.3	1,240,843.7	2,014,551.9
Electric power and water	7,793.8	30,264.5	38,456.3
Public works and construction	745,083.9	1,240,843.7	1,809,849.8
Trade, banking, insurance and services	3,154,316.5	4,509,407.8	622,7492.2
Miscellaneous	1,534,652.3	2,723,803.3	3,307,686.1
GNP	18,515,017.5	30,264,481.5	40,938,381.9
GNP thousand million kwanzas	15,44.9	2,445.3	3,289.2
GNP non-oil	8,659,421.2	13,225,578.4	1,755,5713.4
GNP per capita (dollars)	1,264.6	1,984.8	2,565.6

TABLE 3.4
Investment and Employment in 2006 (estimates due to change)

SECTORS	INVESTMENTS (thousand USD)		EMPLOYMENT		
	Private	Public	Total	Private	Institutional
Agriculture	22.0	83,8	4,781,352		4,781,352
Fishing	7.7	37,3	46,444		46,444
Oil	10,001.5	-	13,689		13,689
Diamonds	-	-	15,654		15,654
Out, extract	85.3	1.4	26,135		26,135
Power/water	-	242.1	-		-
Transform.	172.8	2.0	37,261		37,261
Construction	238.6	311.2	206,521	204	206,725
Mercantile services	842.5	181.5	134,990		134,990
Social services	-	424.1	16,657	197,636	214,293
Institutional sector	-	200.5	-	-	
Miscellaneous	15.1	15.2	65,699	63,704	129,403
TOTAL	11,385.5	1,499.2	5,344,402	261,544	5,605,946

SOURCE: Balanço do Programa do Governo de 2006

3.11.3 - The Attractiveness of Urban Areas and the Exodus of Rural Population

The attractiveness of urban areas over rural population makes 2007 the first time in History when urban inhabitants outnumber rural ones. This is also reflected in Angolan demographics. This situation is made worse by political and cultural reasons, which lead to undervalued wild areas. This can be noticed, for example, by the lack of State institutions in small peoples, the territorial units in which communes were divided since 1975.

There are several reasons that explain the abandonment of rural areas for the last 30 years:

- The war, particularly during the 90's decade, when the conflict assumed greater proportions because cities, with a few exceptions, were a safer shelter;
- The search for employment or other ways to earn a living or even other opportunities that cities, and especially Luanda, offered, despite their poor industrial development;
- The chance for needy people to get in contact with social services. Even though these are inefficient, in rural areas they are nonexistent;
- Peace since, paradoxically, the post-war allowed many people in rural areas to finally reach cities – which explains the population growth in Luanda, since 2002.

This attractiveness of cities in Angola has dramatic consequences. To begin with, whereas, until 1975, the proportion between rural and urban population was of 4 : 1; four farmers to one consumer, nowadays this relation is possibly of one producer to one consumer. In developed countries, this was made up for by industrialization and an increase in agricultural productivity. In Angola, none of this happened. The second consequence is due to the first and is connected with the creation of an army of unemployed that looks for job in informal trade or turns to crime. The third consequence is related to the explosive urban expansion, without proper planning or basic infrastructures, which increases pressure over the existing ones, and therefore, contributes to their deterioration.

3.11.4 - Population Health Status

The population health status in Angola is determined by several conjunctural factors.

The social and medical indicators in Angola, presented in Table 3.6, show a life expectancy of 42.4 years for men and 44.5 years for women. Only 24% of childbirths are assisted by health professionals, the maternal mortality rate is one of the highest in the world, 1850 per 100,000 live newborns and the child mortality rate is of 195 per 1,000 live newborns.

TABLE 3.5
Social and Medical Indicators in Angola

Life expectancy (Men)	42.4
Life expectancy (Women)	44.5
Professionally assisted childbirths (%)	24
Contraceptive prevalence rate (% of women from 15-45 years old)	1,8
Prevalence of HIV/AIDS in pregnant women	8,6 %
Syphilis in pregnant women	5,3 %
Access to basic healthcare services	30 %
Doctor per inhabitant	1/15,109
Child mortality rate (per 1,000 live newborns)	195
Maternal mortality rate (per 1000,000 live newborns)	1,850
Pre-natal coverage (%)	62,3
Fecundity rate (n° of children per women)	6,9
Estimated general population	13.387,000
Women in fertile age	2.945,140
Expected pregnancies	682,737
Expected live newborns	548,867
Expected childbirths	575,641

SOURCE: Plano Estratégico Nacional de Saúde Reprodutiva 2002-2006

Social indicators, such as malnutrition, water and wastewater services access and life expectancy fell drastically during the war and their levels are still worrying.

3.11.4.1 - The nutritional situation

The nutritional situation has always been associated with the lack of stability and national economy. After 2002, the nutritional situation has met some improvements. Most of dislocated families, who lived of humanitarian help, have returned to their homes and started producing for their own subsistence.

Although data concerning family consumerism is inexistent, it can be said that the return of part of the population to agricultural production regions has been increasing the available food. Even though there are still some restricting factors, the rise of agricultural production has registered a positive evolution in the 2002–2004 period.

In 2001, the impact of global chronic malnutrition among children under 5 years old was of 45%. This indicator is of a structural kind and expresses the long periods of starvation these children experienced, during their upbringing.

TABLE 3.6
Nutritional table in 1995/2001

DESIGNATION	URBAN	RURAL	TOTAL
Children > 5 Years Old Height / Age – <i>Moderate Chronic Malnutrition</i>	46,8 / 43,3	57,5 / 49,6	53,1 / 45,2
Children > 5 Years Old Height / Age – <i>Severe Chronic Malnutrition</i>	19,6 / 20,5	32,5 / 25,9	27,2 / 22,1
Children > 5 Years Old Weight / Height – <i>Moderate Malnutrition</i>	5,2 / 6,5	7,1 / 5,8	6,4 / 6,3
Children > 5 Years Old Weight / Height – <i>Severe Acute Malnutrition</i>	1,3 / 1,1	1,8 / 1,1	1,6 / 1,1

SOURCE: Inquérito Indicadores múltiplos, MICS 2 – INE / UNICEF – 1996–2002

3.11.4.2 - Water supply and wastewater services

The lack of investment to improve general access to drinking water and wastewater services has had a negative effect on the population health, especially on the rise of contagious diseases.

Table 3.8 shows the distribution of drinking water and wastewater services accessibility by the population. Even though the percentage of supplied population has slightly increased, this has not been manifested by a decrease in contagious diseases propagation rates.

According to the Ministério da Energia e Águas e do Ambiente e Urbanismo, in 2002 and 2003, these indicators were respectively 62% and 68.5% for water supply access and 59% and 78% concerning proper wastewater services access.

TABLE 3.7
Population with access to drinking water and basic wastewater services, 1996/2001

DESIGNATION	URBAN	RURAL	TOTAL
% of population with access to a drinking water source	46.4 / 70.9	22.2 / 39.9	31.2 / 61.6
% of population with access to proper wastewater services	61.5 / 74.1	26.6 / 25.5	39.6 / 59.4

Source: Inquérito Indicadores múltiplos INE / UNICEF – 1996–2001

3.11.4.3 - Morbidity

The Angolan noso–epidemiological table is dominated by the presence of infectious and parasitic diseases, 80% of which are considered contagious. Out of these, three represent over 90% of all diseases: malaria, acute breathing diseases and acute diarrhoeal diseases..

Malaria is the first cause of disease and, most times, represents over 80% of all cases of contagious diseases (Table 3.8).

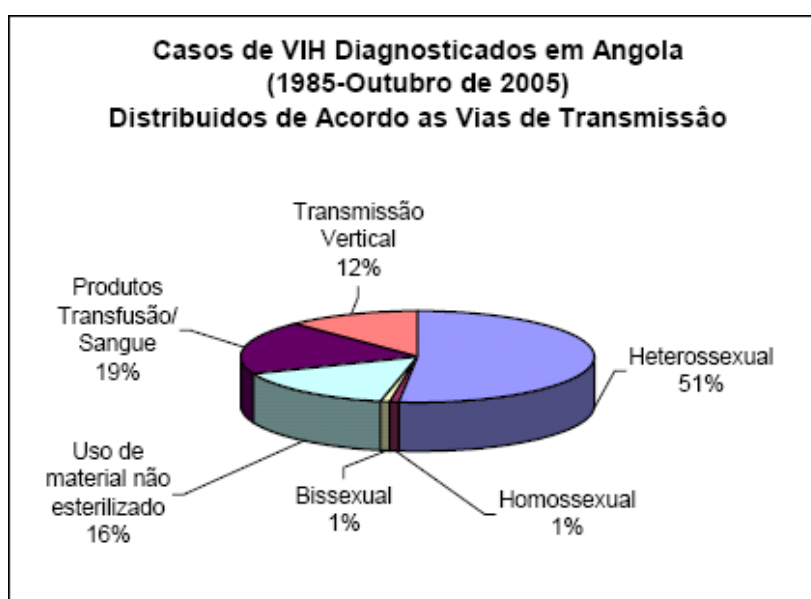
TABLE 3.8
Contagious diseases tendency in Angola (2000–2005)

DISEASES	2000	2002	2004	2005
Malaria	1,635,883	1,840,570	2,489,170	2,329,316
Acute Diarrhoeal Diseases	NA	382,110	490,900	331,211
Acute Breathing Diseases	NA	428,477	515,339	606,648
Trypanosomiasis	NA	4,000	1,657	1,727
Measles	NA	14,722	605	1,331
Meningitis	NA	NA	1,707	1,600
Tetanus NN	NA	309	195	401
Anger	NA	25	55	35
Gastric Fever	NA	NA	79,425	85,452
Tuberculosis	6,424	6,395	12,303	9,539

SOURCE: Boletim Epidemiológico, D.N.S.P, 2002, 2005

The HIV / AIDS is currently the most serious pandemic. The real dimension of this disease in Angola is not properly determined due to the poor epidemiological vigilance and the lack of means of diagnosis. The few known cases are merely notified in the different hospital centres.

Concerning the transmission means, the Figure 3.7 shows the following distribution:



SOURCE: Instituto Nacional de Luta Contra a Sida

FIGURE 3.7
Principals Transmission Ways for the HIV in Angola

Based on the results of multiple clinical reports and case notification sheets, the main means of transmission in Angola is, as in other Sub-Saharan Africa countries, heterosexual relations (51.5%). This situation can be explained by the common sexual relations with multiple partners and by the inconsistent use of contraceptives during occasional relations.

The ratio between men and women is approximately the same, which confirms the data from clinical reports and case notification sheets, where the majority of reported cases are infected through heterosexual relations. The second way of transmission results from the usage of non-sterilised equipment (16%), which is presumably because of the insufficient respect for biosecurity rules in health services.

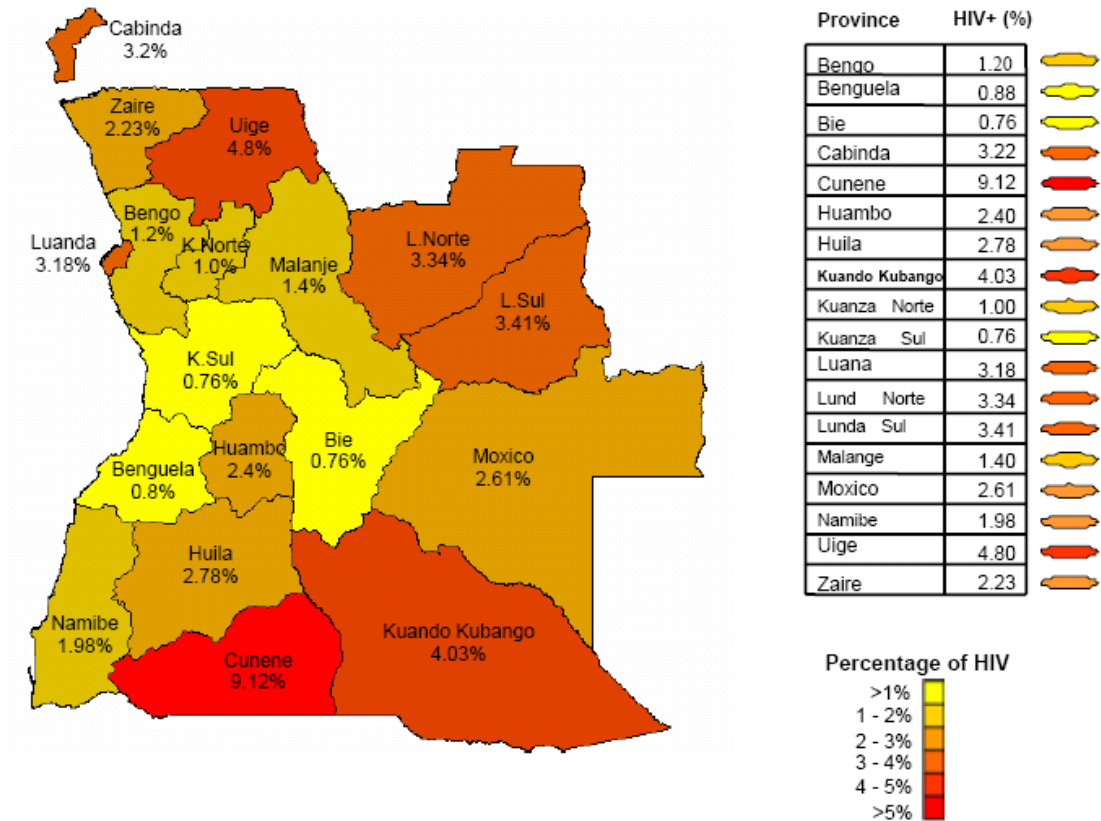
An equally important way of transmission is still blood transfusion, responsible for 15% of the registered cases. This high infection rate is linked with the limited safety policies in transfusions that are only respected in capitals of province.

The HIV / AIDS prevalence rate, estimated to be 4.1% in 2003, is relatively low when compared with the dramatic figures in Austral Africa, the world's subregion that is most affected by this epidemic.

An enquiry from 2004, based on tests to 12,000 women who attended pre-natal appointments in the 18 provinces of the country revealed that only 2.8% were infected, which leads to a total rate of 5% HIV infected (Figure 3.8).

Prevalencia de infecção pelo VIH em mulheres grávidas em consulta pré-natal. Angola, 2004

Prevalência nacional: 2.8 (2.5 – 3.8)



SOURCE: Instituto de Luta contra a Sida

FIGURE 3.8

Predominance of HIV Infected Pregnant Women Attended in Pre-natal Appointments

The low HIV prevalence rate is an opportunity to launch an effective programme to control this pandemic.

The Plano Nacional do Combate ao HIV / SIDA made, in January 2004, an important move in the fight against HIV / AIDS. The 5-year strategic plan, which is worth 160 million dollars, counts on the collaboration of the United Nations, focuses in prevention and reinforcement of institutional capabilities to aid the infected population.

The main factors of the epidemic, in Angola, are:

- The population mobility;
- The low coverage of the National Health Service.

POPULATION MOBILITY

The end of the hostilities, led to significant population migrations, both internally and through the borders with neighbouring countries, including the demobilised, the exiled and the refugees.

In addition, the reopening of roads increased the number of lorry drivers who commute in the inter-provincial road network. This social group, due to the demands of its professional activity, spends significant time periods away from home, which increases chance for occasional sexual relations and multiple partners.

LOW COVERAGE OF THE NATIONAL HEALTH SERVICE

Another important consequence of the three decades of war was the destruction of health services' infrastructures, reducing the total coverage of the services in nearly 50%.

Concerning the number of doctors, estimates point out to a proportion of 5 doctors per 100,000 inhabitants (UNDP, HDR, 2004). In 2003, the Instituto Nacional de Estatística and UNICEF estimated that pre-natal care covered 66% of the population and had an attendance under 40%. The same source states that about 45% of childbirths are assisted by health professionals in national health system structures.

A determinant reason why health services access rates are so low and their quality so poor is the insufficient State funding for social expenses. The few available health funds are split into provincial state budget units and scattered by a large number of policies, programmes and subsectorial plans, without a master plan for the whole sector.

3.11.4.4 - Mortality

The mortality patterns resembles the morbidity pattern, where the epidemiological profile indicates that malaria, acute breathing diseases and acute diarrhoeal diseases represent over 80% of death causes among Angolan population.

The maternal mortality rate is one of the highest in the globe (1 850 per 100,000 childbirths).

Between the main maternal mortality causes we can find:

- Low level of maternal education,
- Low nutritional level;
- High fertility;

- Short break between pregnancies;
- Early pregnancies;
- Little pre-natal care;
- High percentage of domestic childbirths (institutional childbirths = 22.5%) due to geographical and economical reasons.

The Direct Causes of Obstetrical Death are the following:

• Haemorrhages.....	33%
• Unsafe Abortions.....	24%
• Septicaemias.....	17%
• Toxaemias.....	14%
• Uterine ruptures.....	9%
• Others.....	3%

According to UNICEF, Angola has the third highest children mortality rate, 250 deaths per 1,000 children, because of malaria, acute breathing diseases, acute diarrhoeal diseases, measles and neonatal tetanus. Malnutrition is also an important factor, which is estimated to affect almost half of the 7.4 millions of Angolan children.

The World Health Organisation advised, in 1984, that a Reproductive Health component should be integrated in the Mother-Child-Health programme, in 70 centres in 8 capitals of province. In fact, the number of centres has increased ever since.

A Plano Estratégico Nacional de Saúde Reprodutiva 2002–2007, whose goals are to invert the currently high mother or child mortality rates, has been implemented. The institutional coverage of childbirths is very low, with only 22.5% of childbirths that take place in Hospitals. The overwhelming majority are performed by traditional midwives. Concerning professionally assisted childbirths, from 2001 and 2003, the estimated total number of childbirths experienced a small reduction (24% and 22.5%, respectively. These numbers reveal a poor pre-natal coverage).

3.11.4.5 - Disabilities

The true number of disabled people is yet unknown. The data presented in Tables 3.9 and 3.10 expresses the available information at this time.

TABLE 3.9

Number of carriers of physical disabilities in rural and urban areas

DESIGNATION	URBAN	RURAL	TOTAL
<i>Physical disabilities (estimated number)*</i>			70.000
<i>Physical disabilities (per 1000)*</i>			28/1000 men 19/1000 women
% of Disabilities	2,4	3,2	2,9

SOURCES: * Perfil da pobreza em Angola

Remainder :INE (GMCVP) – UNICEF ANGOLA 1996 , INQUÉRITO DE INDICADORES MÚLTIPLOS

TABLE 3.10

Physical disabilities per category

CARRIERS OF DISABILATIES	NUMBER	PERCENTAGE
Civil	55,000	35.4
Military		
Locomotion	34,000	21.9
Sensorial	15,831	10.2
Mental	5,482	3.5
Amputation	45,000	29
TOTAL	155,313	100

It is important to highlight that the available data comes from many different sources, such as the Ministério da Reinserção Social, Defesa, Interior e Antigos Combatentes and the health sector itself. It is estimated that there are about 70,000 carriers of physical disabilities. Out of 1,000 men, 28 are carriers of physical disabilities, whereas out of 1,000 women, 19 are carriers of physical deficiencies, a lower number to some extent.

The percentage of physically disabled population is slightly higher in rural areas than in urban centres, 3.2% against 2.4%.

The majority of carriers of physical disabilities are soldiers, with amputations followed by locomotion disabilities as the most representatives.

3.11.4.6 - Information and education about health conditions

The health education is an essential component of Primary Health Care, through disease prevention and the promotion of a healthy behaviour and lifestyle. The population mobilization and awareness relies on insufficient information.

3.11.4.7 - The health system

The health system in Angola comprises the Serviço Nacional de Saúde, under the orientation and regulation of the Ministério da Saúde, which has a service network in all provinces, organised in three attention levels; the primary level, with Health Posts, Health Centres and Municipal Hospitals; the second level, with General Hospitals, that assures professional assistance; and the third level, with Central Hospitals that offer a specialised medical assistance. There is, as well, a military subsystem that consists in an Central Hospital and several Regional Hospitals (Figure 3.10).

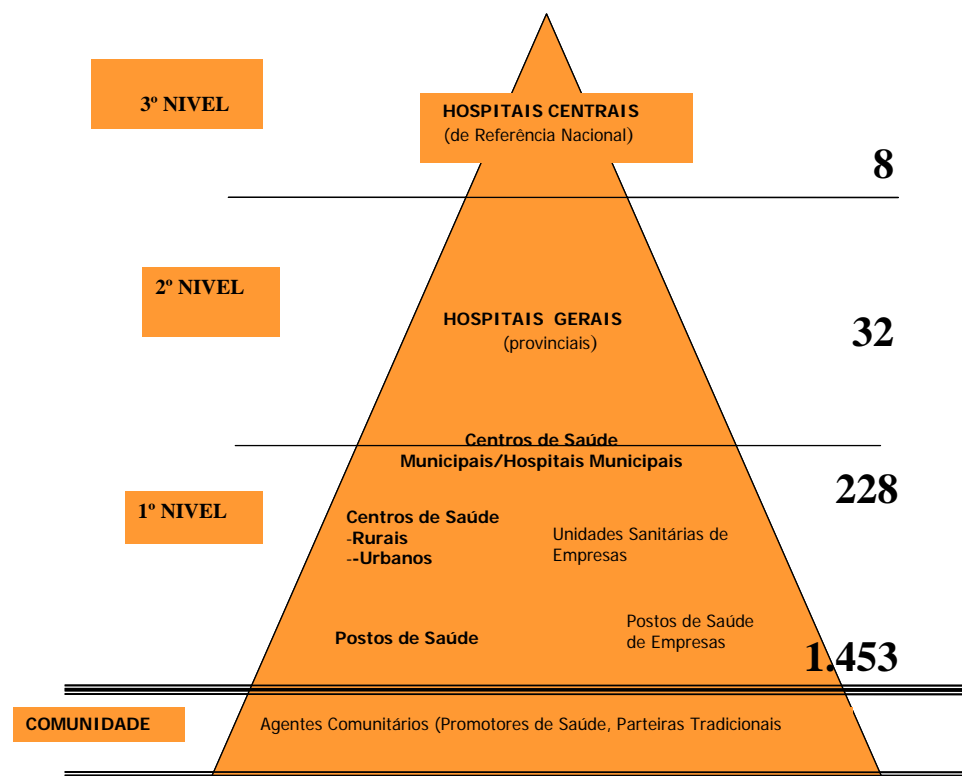


FIGURE 3.10
Organisation Levels of the Serviço Nacional de Saúde

The structure of each level is the following:

- The 1st level integrates approximately 228 municipal hospitals and referential health centres, 1,453 health posts and an indefinite amount of community promoters;

- The 2nd level comprises 32 general hospitals, including provincial hospitals;
- The 3rd level is formed by 8 specialised central hospitals.

The private sector holds a small but strong health services network that serves the workers in oil and diamond extraction companies and their families and, at some extent, public administration through contracts.

According to the Ministério da Saúde, Angola counts with about a total of 28,000 health professionals, namely 1,458 doctors and 26,500 nurses unevenly distributed throughout the country. The concentration is higher in coastal areas and in their capitals of province. In Luanda, 70% of doctors and 30% of nurses can be found..

Besides this irregular distribution, the low salaries do not encourage the improvement of the quality of the services and do nothing to prevent professionals from joining the private sector, a tendency that has increased over the past years.

3.11.5 - Infrastructures

3.11.5.1 - Water and wastewater

According to Relatório de Desenvolvimento Humano de 2006 of the Programa das Nações Unidas (PNUD), the Angolan average water consumption per capita is of 20–30 litres/day, whereas the World Health Organization recommends at least 40 litres/day/person as the minimum limit.

Water and wastewater infrastructures, as well as others, find themselves in poor condition due to war conflicts and lack of proper maintenance. Because of their colonial origin, these infrastructures are mainly located in urban centres, serving only a small proportion of the population and have stopped working for the reasons mentioned above.

The cities of Luanda, Lobito and Benguela have seen their systems improved by interventions that increased the distribution volumes. The systems of Lubango and Namibe work on an irregular basis due to repeated breakdowns and low production level. In the city of Malange, the water supply system is undergoing rehabilitation as part of MPER. In the remaining capitals of province, there are deteriorated systems that have experienced isolated interventions and do not guarantee a regular water supply to the majority of the population.

In the city of Luanda, there are four water systems: Kifangondo I and II, through Bengo, and Southeast Luanda and Casseque, both in Viana through Kwanza; as well as three treatment plants in Kifangondo, Kikuxi and South Luanda.

The available water production capacity can be analysed in Table 3.11.

TABLE 3.11
Available water production capacity

PROVINCE	AVAILABLE CAPACITY (m ³ /day)
Cabinda	12,480
M'Banza Congo	518
Dundo	1,650
Uíje	1,490
Malange	8,544
Saurimo	2,380
Caxito	480
Luanda	289,000
N'Dalatando	1,728
Sumbe	3,840
Luena	1,440
Benguela	70,160
Huambo	6,000
Kuito	900
Namibe	9,600
Lubango	17,500
Menongue	504
Ondjiva	600
TOTALS	428,814
Average per capita ⁵	61

SOURCE: MINEA

In municipal cities, the intake and distribution infrastructures are more concerning issues, since systems have rarely been rehabilitated, mainly as part of the Programa de Aumento e Melhoria de Oferta de Serviços Sociais Básicos. In some other cases, systems have had support from NGO's.

In suburban and rural areas, the access to drinking water is minimal and happens essentially through water spots (wells) and fountains, many of them installed with NGO's and UNICEF's support. Table 3.12 provides a brief description of the situation.

According to these numbers, only 9.7 millions of Angolans have access to piped drinking water, wells or fountains, which represents 60% of total population if we estimate it to be around 16

⁵ The average per capita was estimated by the Ministério da Energia e Águas, for an urban population of seven millions of inhabitants. These numbers are underestimated by the reasons mentioned in Section 3.8.1.

millions, although average consumption rates are very low in rural areas and among poor population.

TABLE 3.12
Drinking water in provinces

PROVINCES	N° OF WELLS	N° OF FOUNTAINS
Cabinda	141	158
Zaíre	23	95
Luanda Norte	24	123
Uíje	12	152
Malange	685	241
Lunda Sul	2	43
Bengo	101	67
Luanda	25	363
Kwanza-Norte	84	83
Kwanza-Sul	26	67
Moxico	112	52
Benguela	197	427
Huambo	678	94
Bié	226	48
Namibe	607	72
Huíla	800	22
Kuando-Kubango	73	26
Cunene	687	41
TOTAL	4,503	2,174
Served Population	1,125,750	1,521,800

SOURCE: MINEA

The following investments are presently taking place:

- Rehabilitation of the water system in Huambo, worth 22 millions dollars and expected to be completed, on contract, by May 2007;
- Rehabilitation of the water systems in the cities of Uíje, Caxito and Catete, worth 21.5 million dollars, initiated in 2005, and over 70% complete;
- Rehabilitation of the water system in Malange, as part of MEPR;
- Rehabilitation of the water system in Benguela, Lobito and Baía Farta;

- Rehabilitation of the water distribution system in Luanda, concerning the plateau and the industrial zone of Viana, the water treatment plant in Kifangondo, worth 20 millions of euros, initiated in 2006 and expected to be finished by the end of 2008 (afterwards, a phase II, costing 30 million dollars, will begin);
- Partial Rehabilitation of the water supply system in Luanda (phase I), costing 44.7 million dollars, which is 64% completed and expected to be finished June 2007;
- Piping renovation of 300 kilometres of conducts and construction of 300 fountains in several municipis of Luanda.

In the end of June, the government approved a water supply programme to rural population that consists in the rehabilitation of intake, reserve and distribution systems so as to provide municipal centres, communes and, especially, schools and health centres with drinking water. In rural areas, wells are to be built and rehabilitated.

Drainage is other serious problem of Angolan cities. In Luanda, the current system was installed during the 40 and 50's decade and, as a result, is virtually obsolete, even concerning the materials, which lack solidity, since they dated back to the 70's decade.

A master plan has been made to convert the two systems, pluvial and domestic, to preserve the main flow lines, which are being misused, and to re-dimension, considering the existing and expanding areas, in 20 to 30 years time.

Luanda has a new solid wastes collection system, based on public-private partnerships, coordinated by ELISAL – EP, which is associated with seven private companies that are in charge of the collection service in each of the nine municipis.

3.11.5.2 - Electrical Power

The main electrical power production hydric centrals in Angola are presented in Table 3.13.

In addition, most of electrical power is produced by gas turbines, which exist in Luanda, Biópio, Huambo and Cabinda.

In Luanda, there are the electrical power distribution subsystems of Cuca, Viana, Cazenga, Nova Vida, Ngola Kiluanje, Congolenses, Mutamba, Golfe, Estrada de Catete and Zango.

TABLE 3.13
Electrical Power Production Hydric Centrals

HYDRIC CENTRAL	LOCATION	POWER (kW)
Capanda	Malange	520
Cambambe	Kwanza Norte	160
Mabubas	Bengo	22
Lomaum	Benguela	
Bópio	Benguela	
Matala	Huíla	27
Ngove	Huambo	60
Others	–	?

The most important ongoing projects are:

- The conclusion of the Ngove central that includes the rehabilitation of the water storage dam. When finished, it will aid the Malata Central in producing power to the southern regions of Angola;
- The rehabilitation of Cambambe central that will also supply the cities of Benguela and Lobito;
- The construction of the Kinfangondo–Mabubas (already completed), Cambambe–Viana–Cazenga and Viana–Luanda Sul–Cazenga (almost completed); Capanda–Lucala–N’Dalatando and Lucala–Uíje transportation networks.
- The conclusion of the Gabela–Lobito line, which will guarantee the connection between the North and Centre systems for the first time;
- The repairs in the Gabela–Sumbe line and the Gabela–Porto Amboim connection;
- The construction or rehabilitation of substations in Lucala, Malange, N’Dalatando, Caxito, Viana, Cazenga, South Luanda, Lobito and Benguela Construção
- The rehabilitation of N’Dalatando, Namibe, Malange, Benguela/Lobito, Huambo and Cabinda distribution networks;
- The rehabilitation of the power network of Luanda;
- The rehabilitation of the Biópio Hydric Central’s substation.

Only municipal centres are equipped with diesel centres, whose power varies from 150 to 1000 kW, allowing only a poor power distribution to the population. Rare are the communes that have generators and, in some, those small equipments serve only the residences of Communal

Administrators. In municipal centres and communes, as in cities, no power from private generators is “sold” in urban centres, unlike what happens to water.

3.11.5.3 - Transportation

The most important transportation infrastructures are:

(I) ROADS

Angola had over eight thousand kilometres of macadamized roads in 1975, which suffered extreme deterioration for years of misuse and lack of maintenance measures. Since 2002, a road rehabilitation programme has, temporarily, rehabilitated, with programmes that last about three to five years, 40 to 50% of roads, concerning their paving and drainage. Near great influence areas, and mostly in the southern regions of the country, rehabilitation is intense and involves the extension of platform to 11 metres, 8 metres of roadway plus 3 of sidewalk (1.5 on each side). In those roads, rehabilitated bridges are still temporary and narrow and, with few exceptions, old drainage systems of water lines were kept.

Beside these main roads, Angola has a secondary transportation road network with over 30 thousand kilometres, under the responsibility of the Instituto Nacional de Estradas de Angola (INEA). The extension of other roads, under the responsibility of the Governo Provincial, is unknown. The transportation network is denser in the Central Plateau and almost inexistent in the East. A rehabilitation project of 748 km of roads is taking place in Bié and Malange, as part of EMPR.

The ongoing rehabilitation works are:

- Malange–Xá–Muteba route;
- Kifangondo–Caxito–Uíje–Negage route;
- Luanda–Porto Amboim route;
- Sumbe–Gabela–Quibala–Wako Kungo route, with over 234 km of extension;
- Onjiva–Humbe route;
- Matala–Matala Connection route;
- Lubango–Namibe route (completed);
- Cacuso–Malange route;
- Dondo–Munenga Connection route;

- Dundo–Saurimo route;
- Kifangondo–Catete route;
- Lucala–Cacuso route;
- Viana–Catete route;
- Huambo–Caála route with 22 km (completed);
- Lobito–Benguela route with 30 km (motorway);
- Luanda–Viana routes with 10 km (express route);
- Bridge over the Catumbela Lobito and Benguela;
- Periferic motorway in Luanda (Benfica)–Viana–Cacuaco;
- (Bifchquete–Massabi) Cabinda route;
- Rehabilitation of the Cabinda–Cacongo route;
- Maria Teresa–Dondo–N’Dalatando–Lucala route;
- Benguela–Matala Connection route in Huíla.

The Ministério das Obras Públicas has recently announced the rehabilitation of 114 bridges, with no specified type or location.

(II) RAILROADS

Angola has four railways.

- Luanda Railway, from Luanda to Malange, with an extension of almost 400 kilometres and a connection between Zenza do Itombe and Dondo, which is being rehabilitated (already working between Luanda and Viana) and is expected to be completed in 2008, with an expected alteration to the initial Luanda–Dondo–Capanda–Malange alignment to avoid the hills near N’Dalatando;
- Amboim Railway, from Porto Amboim to Gabela;
- Benguela Railway, from Lobito to Luau, with connection to Zambia and the Democratic Republic of Congo, whose rehabilitation begun years ago but has faced some delays. Only on the lines between Lobito and Cubal (intermittently) and between Caála and Santa Iria (in Huambo) do train transport passengers and goods;
- Moçamedes Railway, from Namibe to Menongue, although currently it only works until Matala.

(III) SEA ROUTES

The increasingly high traffic of merchandise (equipment, raw materials and consumption goods to meet the needs of construction and infrastructures' repairs) in Angolan main docks and the rise of consumerism levels have created serious problems in their capability. In the city of Luanda, a dry dock was constructed in Viana to minimise this problem, however, there are still great difficulties concerning cargo loading and custom houses' efficiency.

(IV) AIR TRANSPORTATION

Angola has three levels of infrastructures connected with air transportation: a primary level that comprises 18 main airports; a second level that counts over 20 aerodromes (such as Wako Kungo, Porto Amboim, Nzeto, Ambriz, Matala, Xangongo, Andulo and Bailundo) and a third level with close to 1200 airstrips.

The airports that form the primary network are located in all capitals of province, except Bengo and North Kwanza, and in Lobito and Soyo. Two other airports (Negage and Catumbela) are military bases used for commercial companies in exceptional and temporary situations.

The airports that form the primary network share the following characteristics: regular air passenger service; passenger terminals and other assistance services; paved runways; alternative power sources; firemen department; handling (airships, stairs and aerotowing cleaning and disinfection); customs house and customs police; ambulances; parking areas. Only the airport of Luanda has all these services, including the existence of a private handling operator (Ghassist). The remaining airports do not offer all the previously mentioned facilities. In general, inland airports do not meet the internationally established requirements.

The physical conditions of runways are poor and some are ruined by age, intensive use by overloaded aircrafts and reduced or inexistence maintenance. This can be explained by war but also by poor planning and lack of strategic thinking that may come from colonial times, as all airports, including the airport of Luanda, lacks a master plan. The airports of Luanda and Cabinda are the only ones with illuminated runways. All the reasons mentioned above show how vulnerable these structures have become in terms of safety.

In Angola, airport and air navigation services are assured by an entity alone (ENANA – Empresa Pública), in opposition to other countries, like South Africa, for instance.

Angolan airports were relatively well equipped in terms of communication, having 27 NDB and 7 VOR on the beginning of the 80's decade. Nevertheless, war and its effects have caused some serious deterioration. Nowadays, only Luanda has a ILS (for automated landing), VOR and NDB. Seven airports are equipped with NDB: Lubango, Namibe, Huambo, Benguela, Saurimo, Soyo and Cabinda. Only Luanda and Cabinda have air controllers.

However, future expectations are good; some projects plan to equip Angola with a good air navigation service system that is extensible to international flights, bringing EMANA significant profits: five VOR will be installed in Saurimo, Luena, Huambo, Cabinda and Namibe, to support the two great international corridors of air traffic; eight more VOR (including a new one for Luanda) and a remote monitoring system will be purchased; new HF and VHF Extended Range (via satellite) communication systems, which will allow the air controllers in Luanda to provide information and instructions to the entire national air space, without need for air controllers in other airports throughout the country. The purchase of a radar, to increase security and allow aircraft separation in the terminal, is under negotiations.

3.11.5.4 - Communications

Angola has a telephone network with 40 thousands clients (80% of which in Luanda), which is represented in all capitals of province and over municipalities, via satellite, and provides telephone and internet access. In the next years, this network is intended to cover more 600 locations (mainly municipal and commune centres and other geostrategic locations).

A project concerning fibre optics telephone service – that involves wide band internet access and television also – to connect all cities and most municipal centres across main road and railroad axis has already begun and is expected to be completed by 2011. Currently, the fibre optics system is already operating in Luanda, in Lubango–Namibe line and between Onjiva and Santa Clara (Kunene).

Another project that will take place during the next couple of years is the installation of an underwater cable – that will also allow the fibre optics system- between Cabinda and Namibe to connect the coastal urban centres. This cable might be extended to reach Namibia, Congo-Brazaville and the Democratic Republic of Congo.

The mobile telephone network consists of two operators: UNITEL, which uses the GSM norm, has about 2.5 million subscribers and covers all capitals of province and close to a third of

municipalities; and MOVICEL, with CDMA norm, provides 1.5 million subscribers in all capitals of province and 25% of municipalities.

3.11.6 - Education

The educational system in Angola is characterized by a high demand for educational infrastructures, in spite of the low literacy rates, which are due to the fact that most existing school facilities are destroyed or deteriorated.

According to MINUA (2006), the Angolan population is incredibly young, with half of the population aged less than 15 years old. Quoting the statistics of the Ministério da Educação, population in pre-school age represented approximately 17% of the population and population in school (2–25 years old) about 43%.

The available data on the Angolan school system shows that literacy rates are very low, associated with high school dropout rates (30%) and also high reprobation rates (30–35%). The illiteracy rate is higher among female population, which has an impact over the educational level of children and the general welfare of the family.

The United Nations' indicators have revealed an illiteracy rate of 58% in population aged more than 15 years old, in Angola.

The accessibility to the regular school system, which is the percentage of enrolled children in age of attending classes (6–9 years old), is 56%. This rate is higher in coastal urban centres, where it reaches 61%. Considering other age groups, this rate increases to 75%.

The percentage of adults that never attended classes is different in rural and urban areas. About 42% of rural population have never studied while, in urban centres, this percentage is 24% (MINUA, 2006).

Concerning the access to education, there is a huge difference between poor families and rich families, since only 35% of poor children attend classes in opposition to 77% in rich families.

It is estimated that 10% of the 300,000 children with special needs are integrated in the national school system.

Concerning human resources and school equipments, it must be said that the academic and pedagogical level of teachers is low and teachers and school facilities are insufficient.

The future is expected to bring the construction, rehabilitation and expansion of medium institutes and second and third grades schools, in a total of 114 educational establishments, with emphasis in the provinces of Huambo, Bié, South Lunda, Uíge, Malange, Bengo, North Lunda, Benguela and Huíla, which aim to improve the educational system condition.

3.11.7 - Cultural Heritage

The overestimation of etnolinguistic differences in Angola is virtually pointless. If it is true that the national cultural unification is still happening, one cannot consider that the concept of nationhood means or determines – as it should be otherwise – a cultural homogeneity. Despite all the crises and conflicts that took place during the 20th century, Angola has still, in contrast to other African countries, “a population that shares a rich cultural heritage and a common historical past”, based in the Bantu cultural substract of the majority of the population, the authority of Christian religions (under many forms) and the struggle for independence⁶. The civil war itself can be considered an identity aspect, since soldiers fighting for both factions were from all regions of the country, and therefore, regarded themselves as part of several existing etnolinguistic groups. The geographical mobility, the urbanization, the literacy and inter-ethnic marriages and fact relationships contribute to a strong interaction between culturally different groups and to the growing increase of importance of the Portuguese language as a means of communication and identity.

Even though each “ethnicity” does not have a definite pattern, one cannot ignore the motivating power of ethnicity as a social consciousness and group identity phenomenon, without compromising other identities, such as sub-groups, national or international. An Angolan can regard himself as a member of the Ovimbundu community and, within that group, be identified as a *bailundo* or a *ndulo*. Nevertheless, at the same time, they are proud of being African and integrating that group, considering cultural ties, such as habits and customs, type of institutions and others, to many other African nations. Ethnic consciousness, citizenship and national consciousness can, as you can see, coexist.

The ethnical map of Angola by José Redinha dates back to the 60’s decade and the author himself is aware that facts should be carefully interpreted since some ethnical traits are not clear. There are also some perpetrated misconceptions that contradict this consciousness. The Ovimbundu, for instance, are often restricted to the Central Plateau, when they also live in Benguela, Huíla, Namibe and, rarely, other provinces in the northern and eastern regions of the country, where they have been looking for job and other opportunities for the last five or six decades. In some provinces like Bié,

⁶ See Maria da Conceição Neto: *Reconstrução Nacional: Desafios e Perspectivas*, in *O cidadão e a Política*, CEAS and Centro Cultural Mosaiko, Luanda, 2003.

South Kwanza or Uíje, for instance, not to mention Luanda, it is not possible to talk about ethnic homogeneity.

The main Angolan cultural frame is represented by the peoples that claim themselves as belonging to the Bantu tribes. That can be explained by the influence of different important civilizations over the Angolan territory: the hunters and farmers from Central Africa's savannah, which are the ancestors of today's Lunda, Cokwe, Lwena, Luvale, among other; the bovine herders from the Great Lakes and sandy tropical or semi-desertic zones of Austral Africa, where Herero, Humbe and Ambo, for example, can be found; and other peoples associated with Congo or Zaire's basin tropical forest cultures (where Bakongo are integrated)⁷.

Nowadays peoples are the result of migrations and interpenetrations, adoptions or absorptions of languages, technologies, institutions and crops. The influence of Atlantic trade, colonization and Christianisation have produced some changes but have also faced some fierce resistance still present not only in today's social behaviour, but also in family organization, market and trade structures, the way inherited goods determine individual's social and political status, in political lobbies, ancestor cults and the search for social, economic, and even political advantages in the so-called magical-religious power entities.

Centralized political structures, such as today's states or kingdoms, defied Portuguese colonialism until the 19th century. Rarely did these social structures mean population's ethnic homogeneity. The diffusion of techniques, work instruments, crops from other continents; the adoption of political institutions and long distance trade emphasise the dynamism of these societies and contradict commonly perpetrated ideas of isolation and primitivism.

Before the impact of colonisation, the Bantu in Angola were mainly farmers that grew cereals and/or root vegetables, being the Herero and the Ovambo those who mainly herd cattle, which was also done by the Nyaneka, the Ovimbundu and the Nganguela, who combined both agriculture and animal husbandry in different proportions. Besides, specialized professionals or artisans working with iron and copper or making baskets and cloths or producing beverages could also be found.

To sum up, the Ovimbundu can be said to have become famous for their trading skills, a popular activity until the beginning of the 20th century, when the end of (slaves, ivory and rubber) caravans and the Portuguese presence in the Central Plateau made these experienced traders turned to agriculture, becoming market oriented farmers. The Bagongo, the Cokwe and some Mbundu sub-

⁷ These and other historical and anthropological judgements in this Section are based in the words of Maria da Conceição Neto *História e Etnicidade na Sociedade Angolana*, 1996.

-groups were also skilled traders (and, in some way, they still are); together with the Ovimbundu, these groups have been influenced the most by the western patterns (through State, Church and trade, which had a stronger influence) increasing their social mobility; the permanent contact with the DRC, before and after its independence, contributed alongside the previously mentioned factors to the increased social mobility of the Bakongo; the Cokwe and the Naganguela, on the other hand, took little advantage of the social mobility mentioned above, and have the lowest literacy rates; that is also seen in the situation of a few shepherds and agroshepherds (the Ovambo, the Herero and the Nyaneka) who are considered to be very conservative and reluctant to accept western culture; the Ovimbundu, the largest ethnolinguistic group in demographic terms, became, in the 50's decade, the largest supplier of both willing and compulsory workforce to other regions of the country. This happened due to the arrival of settlers to the Central Plateau, which occupied their lands, reducing their capability to subsist alone; the Mubundu were the ones that registered the highest number of mixed race births and the most influence of cultural areas, such as music, food and language, which has happened due to their closeness to the centre of political power in Angola.

Another significant element of the cultural heritage is the land. Although the market's influences and population density have caused some pressure over the notion of possession, turning community (large extensions of less populated) land in individual or family land (where population density is higher, urban areas are nearer and there are permanent crops installed), the concept of land as a gift from God or ancestors – a vision shared by common sense – is still largely dominant. It is believed that community authorities have merely the purpose of managing it and passing it on to the next generations. Though, it is natural to regard land as a production asset in regions where western ideals and market have a determinant role.

3.11.8 - Physical Heritage

Angola has 201 classified monuments and historic sites, from fortresses, public buildings, churches and palaces to archaeological stations, ruins, streets, paintings and stone carvings. The concentration is highest in Luanda (92), followed by Benguela (30), Bengo (12), Uíje (12) and North Kwanza (10).

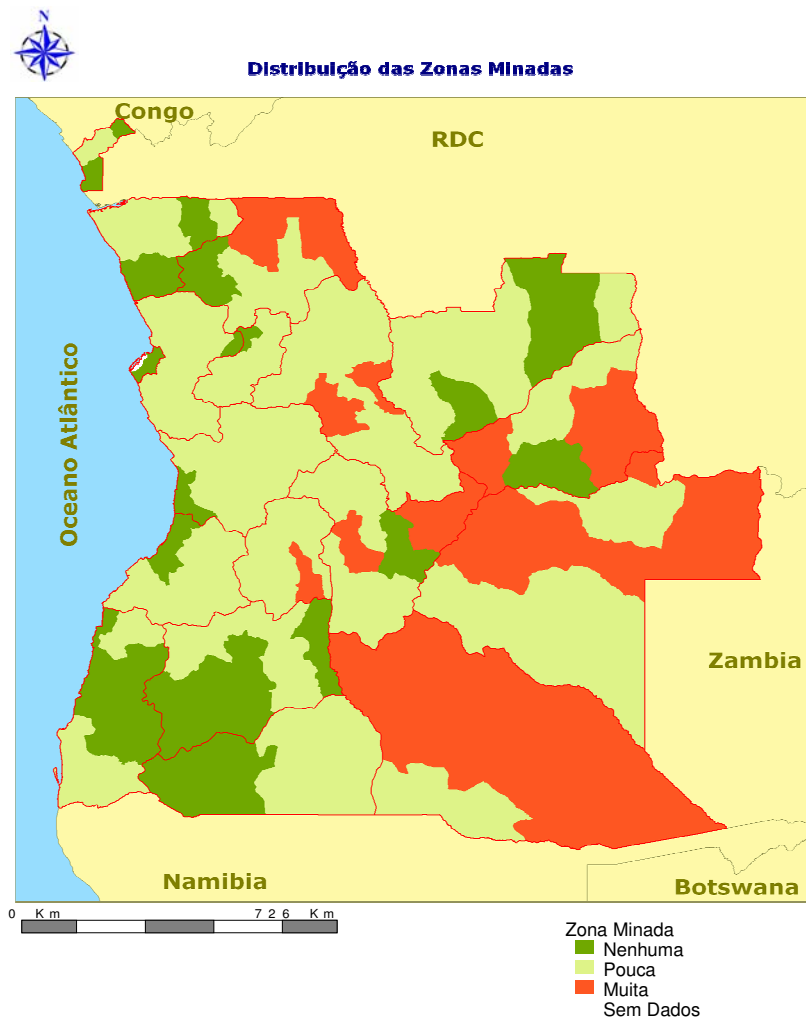
3.12 - MINED ZONES AND PRESUMABLY MINED ZONES

As a result of 27 years of Angolan civil war, the territory is highly contaminated with mines and other explosive devices yet to be detonated.

Landmines in Angola represent a serious obstacle to every project. Several national (15) and international (6) mine dismantling organisations and specialised organisations that provide technical assistance and support to those injured by mines are dealing with this issue.

According to MINADER / FAO (2006), the Angolan territory presents the following distribution of landmine fields (Figure 3.9).

The Angolan territory can be divided in three different zones concerning the number of existing mine fields across the country: None, Few and Many. Table 3.14 shows the provinces under the influence of EMRP that were rated as having Many Mined Zones.



SOURCE: MINADER / FAO, 2006

FIGURE 3.9
Distribution of Landmine Fields in Angolan Territory

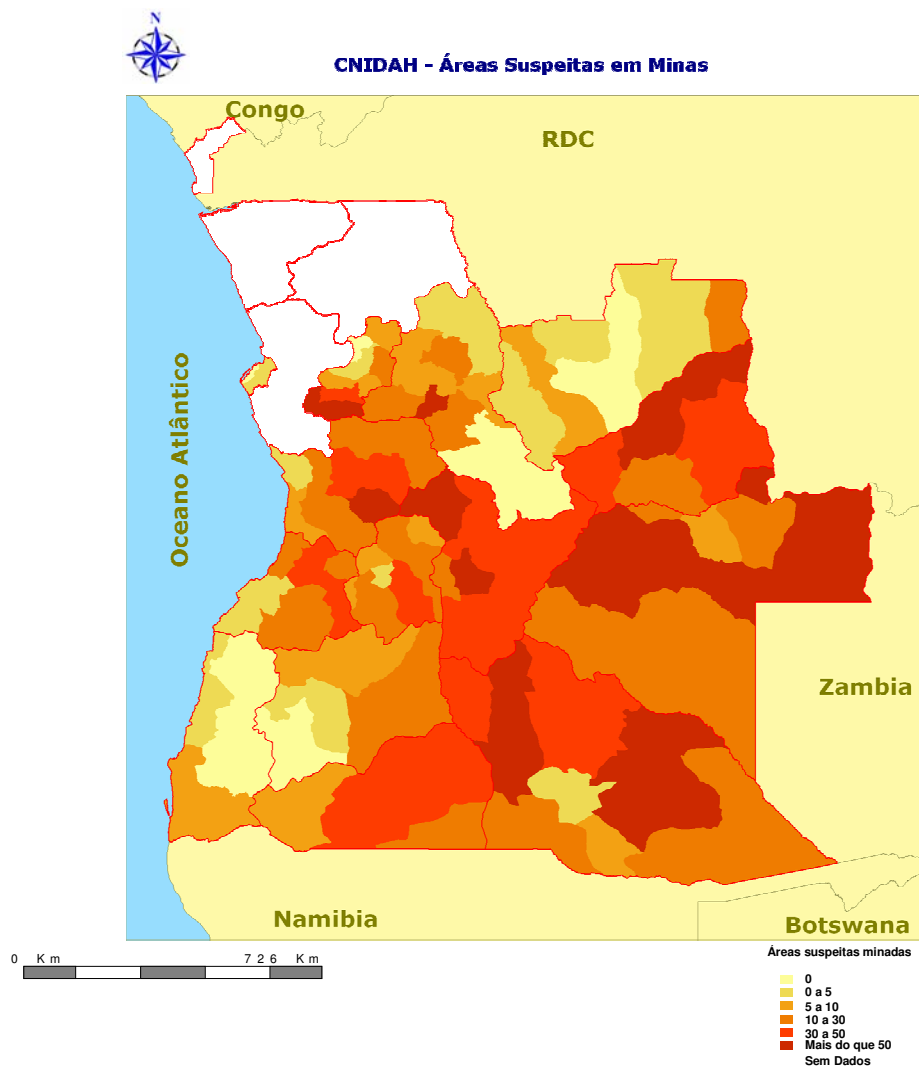
TABLE 3.14
 Mined Zone

PROVINCE	MUNICIPALITY
Bié	Kuíto and Lueba
Huambo	Tchikala-Tcholo-hanga

Malange	Malange, Cangandala and Quela
Moxico	Alto Zambeze, Luena and Leua
Uíge	Maquela do Zamba, Damba, Quimbele and Santa Cruz

Quoting (MINUA, 2005) “in most cases, there is no record of mining operations nor is their location mapped with precision”.

According to CNIDAH, the Angolan territory presents the following geographical distribution of Presumably Mined Zones (Figure 3.10).



SOURCE: MINADER / FAO 2006

FIGURE 3.10
Presumably Mined Zones

For the seven provinces where EMRP’s works will take place, Bié and Huambo are the ones that present the highest risk, with the largest number of presumably mined zones, 360 and 324 respectively. The municipalities of Andulo and Kuito, both in the province of Bié, are the ones with the highest number of presumably mined zones, 95 and 94 respectively.

The province Luanda presents a single presumably mined zone, in the municipality of Viana. There is no available data about the province of Uíge.

According to the Relatório de Desenvolvimento Humano of the United Nations from 2002, it is estimated that, during the war times, more than a million people have died, hundreds of thousands have been physically injured and four millions have been forced to leave their home places.

Quoting (MINUA, 2005) “in most cases, there is no record of mining operations nor is their location known with precision”.

The unknown location of landmines has lead to repeated incidents. CNIDAH’s numbers indicate that 26 people have died and 70 were injured as a result of mines, in 2005.

This situation has severe effects over the living standards of the population at many levels, as it reduces its freedom of circulation, and therefore, increases isolation and separation.

According to CNIDAH (2005) there are more than 4,589 mine fields with more than 142 types of explosive devices.

During the year of 2005, the results of mine detection activities are expressed in Table 3.15.

TABLE 3.15
 Demining actions in 2005

DEMING ACTIONS	
km of checked/controlled roads	0
Manual Demining (m ²)	11,932,890
Mechanic Demining (m ²)	2,329,706
Total dismantled area(m ²)	14,262,596
Battlefield cleaning – Bac (m ²)	0
Isolated tasks (EOD)	1,321
Removed/destroyed anti-personal mines	4,770
Removed/destroyed anti-tank mines	358
Removed/destroyed uxos’s	738,357
Destroyed ammunitions	1,334

Other explosive devices	3,942
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SOURCE: MINUA (2006)

PROVINCE OF BIÉ



GEOGRAPHICAL SITUATION

The province of Bié locates in the central area of Angola, being limited at North by Malange, at Northeast by Kwanza Norte, at East by Huambo, at South by Cuando Cubango, at East by Moxico and at Northwest by Lunda Sul, with a surface area of 70 269 km², corresponding to close 5.6% of the Angolan territory total area.

CLIMATE

Northeast	Tropical wet with alternately dry and rainy seasons	<ul style="list-style-type: none"> • Precipitation between 1100 and 1300 mm • Annual average temperature of 20 to 22°C • Classification of Thornthwaite: Mesothermic, humid climate (B1 and B2)
Center	temperate, with hot temperatures	<p>Precipitation between 1150 mm (S-SW) and 1400 mm (planaltic regions and center-west)</p> <p>Average annual temperature 19 to 20°C</p> <p>Classification of Thornthwaite: mesothermic, humid climate (B1, B2 and B3)</p>
South	Tropical wet	<p>Precipitation between 1100 mm and 900 mm</p> <p>Annual average temperature of 19°C (north) to 21°C (south end)</p> <p>3. Classification of Thornthwaite: mesothermic tropical rainy (B1) humid climate.</p>

GEOLOGY

Northeast	<p>Presence of the Solid Old formations, that form the Compound of Base, of lower Archaic and Proterozoic ages (constituted by metamorphic rocks, being the most frequent the gneiss and granite-gneiss).</p> <p>To the east, covering formations of the upper Proterozoic (constituted by consolidated sedimentary rocks, with little or any metamorphization, constituted by graywacke, schists, loamy and rude arkoses</p>
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	of purple color) exist. That is the “Xisto-Gresoso” group of Western Congo Supergroup.
Eastern	Presence of sandy covering formations (non consolidated deposits with high thickness, that usually settle in a stratum of polymorphic “grés”, attributed to the lower Tertiary), being the most recent covering formed by aeolic sands, whose deposition took place in the Plistocenic). This group belongs to the Kalahari Group, in their lower polymorphic “grés” and upper ocher sand formations.
South Central	Presence of the previously referred formations with an increase, in the South, of the sands of Kalahari area.

HIDROGRAPHY

<i>North</i>	It corresponds to a wide transition strip between the planaltic areas of larger altitude at west, and the extensive sandy surfaces of Kalahari in its eastern limit. The Kwanza river and their tributaries Cuquema and Luango that have a S-N orientation, drain to the south part of this surface of lower level, relatively to the planaltic platforms that they involve, constituting therefore the Alto Kwanza. This plain falls soft and gradually to north, ranging from 1520 meters in the higher altitudes, to 1070 meters in the confluence of the Luando and Kwanza rivers. In the North part, no residual reliefs occur, corresponding to a perfect plain. An important characteristic concerns the extensive wet flood plain, designated locally by "anharas", that occur between Cuquema and Cuanza, and develop in a wide area.
<i>Southeast</i>	The Central Plateau is drained by the rivers that constitute the two great hydrographic basins of southern Angola, Cubango and Cunene, whose headstreams locate very close, at 1830 meters of altitude, close to Vila Nova. This morphologic surface is characterized by its typical wavy relief and wide horizons, in which the main rivers run in open deep valleys and often with rapids and rocky beds. The secondary rivers, of permanent flow circulate in wide and marshy valleys with meanders. In this planaltic morphologic unit plenty residual reliefs occur, whose tops reach the primitive surface altitudes.
<i>South</i>	It corresponds to a transition area of the Central Plateau for Cuango Cubango, in other words, for the semi-arid areas of the south of the territory. This surface is part of the Cubango plain, one of the main rivers of the area that starts at the Central Plateau, and crosses it from north to south in its maxim extension, being completely involved in its hydrographic basin. The whole surface presents several streams with N-S orientation. The main Cubango tributary is the river Cuchi, followed by Cutato, Ganguelas and Cuebe. The whole plain is drained by a dense and tight hydrographic net, forming open and deep valleys with separate parallel streams, south oriented.

ECOLOGICAL ASPECTS

Areas of ecological interest	A proposal for the creation, in partnership with the Province of Huambo, of the Natural Regional Park of Cutato exists.
Fauna	Currently, no great populations of wild animals (great antelopes, elephants, predators and crocodiles) that were formerly abundant in the area exist, due to the wild hunt, habitat destruction and human occupation. More studies are needed.
Flora	A great variety of vegetation cover types exists, due to the existence of several biomes, constituted by “panda forest” in well drained soils and by savannas along the watercourses in the poor drained areas and by marshy grasslands in the flooded areas
	The dominant species are Brachystegia sp., Julbernardia paniculata, Isoberlinia angolensis, Monotes caloneurus Parnari curatellifolia, Pericopsis angolensis and Pterocarpus angolensis (“panda forest”); Loudetia spp, Ctenium, Trystachia, Eragrostis, Digitaria Heteropogon, Rhynchelytrum, Syzygium guineense, Parinari

	capense, <i>Paivaeusa dactylophyla</i> (savanna); <i>Phragmites mauritianus</i> (along the rivers and in the marshy grasslands).
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DEMOGRAPHY

The province of Bié is constituted by 9 municipal districts with an average population density of 17.44 hab/km², being Kuito the municipal district with a higher population density, being followed Katabola, Chinguar and Cunhinga.

Municipality	Nº of inhabitants	Territorial extension (km2)	Population density
Kuito	374500	4814	77,79
Andulo	162454	10316	15,75
Nharea	88031	7560	11,64
Kamacupa	154371	9469	16,30
Katabola	149329	3028	49,32
Chinguar	136423	3054	44,67
Chitembo	53443	19098	2,80
Cuamba	40301	11421	3,53
Cunhinga	66717	1509	44,21
TOTAL	1.225.569	70.269	17,44

ECONOMICAL ACTIVITIES

The main economic activities are agriculture (the main agricultural crops are corn, cassava and potato), informal trade and formal trade (services). In 2006 about 240 000 families were in the agriculture sector.

HEALTH

<i>Main illnesses</i>	Malaria, acute diarrheas, acute breathing diseases, measles, tuberculosis and subnutrition.
<i>Health Infra-structures</i>	Hospitals (10), medical centres (13) and health centres (77)
	180,000 inhabitants / hospital

EDUCATION

<i>Children' out of the education system</i>	240 000 children
<i>Deficit of classrooms</i>	2 400 classroom
TEACHERS' SHORTAGE	4 800 teachers

INFRA-STRUCTURES

<i>Water and sanitation</i>	There is no distribution and water sanitation systems
<i>Electrical energy</i>	In 2003 the energy generating capacity was 1840 KVA (Kuító), 100 KVA (Chinguar), 100 KVA (Camacupa) e 100 KVA (Andulo).
<i>Communications</i>	<p>Roads: more than a thousand kilometres and several bridges need rehabilitation.</p> <p>Aerial: airport (Kuító, under rehabilitation), paved track (Andulo) and unpaved tracks (Catabola and Camacupa).</p> <p>Railways: Benguela Railway (inactive).</p> <p>Telecommunications: Telephone (only in Kuító) and mobile phone (in Kuító, Andulo, Chinguar and Camacupa).</p>

CULTURAL HERITAGE

<i>Main etnolinguistics groups</i>	Ovimbundu umbundu, Ngangela, Cokue, Luimbi and Songgo.
<i>Predominant languages</i>	Portuguese and umbundo.
<i>Physical heritage</i>	Old telegraphic and postal station located in Camacupa (classified monument), “embala” Ekovongo, confluence between the Kwanza and Kuquemo rivers and angolan geodesic center of in Camacupa.

Presumably Mined Zones

MUNICIPALITY	NUMBER OF PRESUMABLY MINED ZONES
PROVINCE OF BIÉ	360
Andulo	95
Camacupa	41
Catabola	35
Chitembo	47
Cunhinga	48
Kuito	94
Nharea	33

Chingar	11
Camacupa	41

PROVINCE OF HUAMBO



GEOGRAPHICAL SITUATION

The province of Huambo is limited at northeast by Kuanza Sul and Benguela, at south by Huila and at East by Bie. Huambo occupies an area of 34,271 km², representing about 2.7% of the angolan territory total area.

CLIMATE

Tropical, with alternating wet and dry seasons	<ul style="list-style-type: none"> • Precipitation between 1100 (S-SW) and 1400 mm (top planaltic center-west) • Average annual temperature of 19 to 20°C • Average annual relative humidity 60 to 70% • Classification of Thornthwaite: Mesotermic, humid climate (B₁ and B₂)
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GEOLOGY

East-Northeast	<p>Presence of the Compound of Base formations, in the E-NE and in the eruptive granitic in the remaining W-SW (constituted by crystalline rocks of the Arcaic and of the lower Proterozoic).</p> <p>The oldest formations that are included in the Compound of Base, correspond to metamorphic rocks or rocks eith some level of metamorphization (the granite-gneisses,the ortogneisses,the granites, granodiorites, the quartzites and other quartziticrocks are the most abundant materials). These formations are only marked in the valleys or in the scarp surfaces, and not considered as outcrops. The great rocky monoliths, that form important rocky ridges that can reach the 2000 metres of altitude, are constituted by metasedimentar rocks of the quartzites and quartzitic schist types .</p>
West	<p>The mid western side stretches towards the south of Kwanza, and it is composed by a complex of eruptives rocks (mainly granites, granodiorites and quartzites).</p> <p>On the south side of the Benguela Railway, the most frequent outcrops are the quartzites side by side with the granite, while in the north of the railway, the granites are more abundant.</p>

HYDROGRAPHY

	The Planalto Central morphology includes two plain surfaces divided by a steep slope. The older morphologic unit corresponds to the high plateaus, that show a plain or wavy relief,
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	with altitudes ranging from 1750 to 1800 metres. The rocky substratum is, in the majority of the cases, gnaissoid and it is covered in some parts by thin sand layers. In this plain area, quartzite rocks outcrops hardly occur until 2000 metres of altitude. The large rivers have their origin in those top surfaces, frequently called “anharas”. In the north part occur the Queve, Cutato, Cunhinga and Cunje rivers (the former three rivers are tributaries of the Kwanza river), and in the opposite part two, important hydrographic basins of Angola occur, the Cubango and the Cunene hydrographic basins, whose headquarters are located at 1830 metres of altitude, close to Vila Nova.
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ECOLOGICAL ASPECTS

<i>Areas of Ecological Interest</i>	A proposal for the creation, in partnership with Bié, of the Parque Regional Natural do Cuato (Cutato Natural Regional Park) exists. Additionally, a proposal for the establishment of the Reserva Natural Integral do Monte do Môco (Monte do Môco Integral Natural Reserve) exists.
<i>Fauna</i>	The fauna of the province was negatively affected by hunt, habitat destruction and pesticide use for plague control. It is foreseen some level of rehabilitation, namely of small antelopes and predators, but more studies are needed.
<i>Flora</i>	The vegetation cover includes forests, at the higher altitude sites (mata de panda) and savannas along the rivers. Currently, almost all woody vegetation is destroyed, in some cases replaced by exotic species, such as eucalyptus, resin trees and several fruit trees. The dominant species are: <i>Brachystegia sp.</i> , <i>Julbernardia paniculata</i> , <i>Isobertinia angolensis</i> , <i>Monotes caloneurus</i> Parnari <i>curatellifolia</i> , <i>Pericopsis angolensis</i> e <i>Pterocarpus angolensis</i> (“mata de panda”); <i>Loudetia spp.</i> , <i>Ctenium</i> , <i>Tristachya</i> , <i>Eragrostis</i> , <i>Digitaria</i> , <i>Heteropogon</i> , <i>Rhynchelytrum</i> , <i>Syzygium guineense</i> , var. <i>huillense</i> , <i>Parinari capense</i> , <i>Paivaeusa dactylophylla</i> , <i>Annona cuneata</i> e <i>Protea tricophylla</i> (savanna); <i>Phragmites mauritanus</i> (along the rivers).

DEMOGRAPHY

The province of Huambo consists of 11 municipality districts with an average population density of 7.7 hab/km², with Huambo being the municipality with higher population density (166,42 hab/km²), followed by Caala (65,66 hab/km²) and Lunduimbali (48,40 hab/km²).

Municipality	N ^{er} of inhabitants	Territorial Dimension (km ²)	Population Density
Huambo	434191	2609	166,42
Caála	175910	2680	65,64
Catchiungo	59517	2447	24,32
Longonjo	64828	2915	22,24
Ukuma	33281	1600	20,80
Ekunha	56072	1677	33,44
Lunduimbali	130587	2698	48,40
Bailund	199014	7065	28,17
Mungo	37285	5400	6,90

Tchicala Tcholo-hanga	49354	4380	11,27
Tchindjenje	21045	800	26,31
TOTAL	1.261.084	34.271	36,79

ECONOMICAL ACTIVITIES

The main economical activities are: agriculture, livestock, formal trade (services), informal trade and it elaborates (motorcycle manufacturing, refrigerators and drinks brewing).

The main agricultural crops are: potato, corn and sweet potato .In 2006, about 400,000 families worked in the agricultural sector.

HEALTH

Main Illnesses	Malaria, diarrhea and acute respiratory infections.
Health Infra-structures	Hospitals (12), medical centres (30, only 18 operational) and health centres (71, only 12 operational).
Medical staff	0,38 doctors/ 10 000 inhabitants 11,27 nurses/ 10 000 inhabitants

EDUCATION

<i>Number of un-schooled children</i>	162 696
<i>Classroom shortage</i>	Three sub-systems of education: primary, secondary and superior that operate with countless difficulties. The three Medium Institutes, Pre academic Center and the School of Basic Formation of Teachers operate without their own facilities.

INFRASTRUCTURES

Water and Sanitation	Two water captations stations and three water elevatory distribution stations with eight electropumps (municipal district of Huambo) and water captation by gravity (remaining municipal districts).
Electrical Energy	Energy generating capacity in 2003 was 21.927 KVA (only 7.827 available KVA)
Communications	Roads: The Huambo-Caala (22km) and Alto-Hama untill almost the limit with Kwanza Sul

	<p>sections are totally rehabilitated: Road Huambo-Kuito is degraded although it was rehabilitated in 2006 as well as the section Huambo- Alto-Hama. In 2003 they were marked up 727 km of roads that needed intervention of which only a small part was landfilled.</p> <p>port (functional) and unpaved tracks (degraded).</p> <p>Benguela Railway is operational in the 40 km section from Calenga to Santa Iria, passing through the cities of Caala and Huambo.</p> <p>communications, telephone (just in Huambo) and mobile telephone (only in the headquarters or the municipal district of Huambo , Caala and Bailundo).</p>
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CULTURAL HERITAGE

Main etnolinguistic groups	Ovimbundu and several groups (Vambalundu, Vawambu, Vacyaka, Vasambo, etc).
Predominant languages	Portuguese and umbundo.
Physical heritage	Kissala fortress (classified monument), of the XIX th century.

Presumably Mined Zones

MUNICIPALITY	NUMBER OF PRESUMABLY MINED ZONES
PROVINCE OF HUAMBO	324
Bailundo	24
Caala	21
Ekunha	3
Huambo	44
Kathihungo	22
Loduimbali	6
Longonjo	18
Mungo	9
Tchicala–TcholoHanga	36
Tchinjenje	10
Ukuma	13

PROVINCE OF KWANZA NORTE



GEOGRAPHICAL SITUATION

The province of Kwanza Norte is located in the northeast zone of Angola, and is limited at north by Uige, at east by Bengo, at south by Kuanza Sul and at south by Malange.

Kwanza Norte has approximately 19,307 km², corresponding to about 1.5% of the angolan territory total area.

CLIMATE

Tropical hot and humid	<ul style="list-style-type: none"> • Precipitation between 900 (west) and 1500 mm (interior) • Average relative humidity greater than 80% • Classification of Thornthwaite: mesothermic climate (interior) a megathermic, sub-humid (C2) to rainy humid (B1 e B2)
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GEOLOGY

Presence of the formations of the Compound of Base of the Archaic and of lower Proterozoic that occur in the bordering strip of the West and South sides, where the rocks of the Solid Old surface continually outcrop, and on the sedimentary formations of upper Proterozoic that have large representation, covering again the Compound of Base in almost the total extension of the area. The formations of the Compound of Base are mainly constituted by gneiss, granite-gneiss rocks and less frequently by muscovitic schists, anfibolites, calcareous schists and micacic schists, originated by the intense metamorphism that occurred on the primitive sedimentary rocks when important orogenies took place in the lower and upper Archaic.

The upper proterozoic rocks are distributed by four groups.

The inferior level, designated by Earthy Group (old Sansikwa), occupies a central strip in the area,

with N-S orientation, producing a quite expressive relief with altered or strongly wavy forms it is constituted by arkoses in the base, followed by arkosic schists, quartzitic schists and quartzites. Almost in the top, an important formation exists composed by limestones, quartzitos and cherts, that end in thick strata of loamy and quartzitics schists.

The Alto Chiloango and Schist-limestone groups and are less expressive, and the “Xisto-Gresoso” are found in the remaining south area of this zone. It is represented by a formation of limestone conglomerate and of cherte in a calcarenite matrix, over several materials of great thickness, more or less stratified, mainly loamy schists, arkoses and silts, more or less mica and feldspates and with red coloration.

ECOLOGICAL ASPECTS

<i>Areas of Ecological Interest</i>	Currently, no natural protection areas exist, although forest reservations have already existed. In spite of the high biodiversity, no proposals exist for the establishment of natural protect areas and, more studies are needed.
<i>Fauna</i>	Few information exist on the fauna of the province but due to the steep relief the species silvatic have larger defense, so is probable that reasonable populations of great mammals, primates and a very rich avifauna still remain.
<i>Flora</i>	Unlike the fauna of the area, the flora is well studied. The vegetation cover is constituted by a dense forest and humid semi-deciduous and savanna, with bushes or little bushes (almost the totality of the province).
	The dominant species are: <i>Albizia gummifera</i> , <i>A. Glaberrim</i> , <i>A. Ferrugínea</i> , <i>Celtis zenkeri</i> , <i>C. prantlii</i> , <i>Ficus mucoso</i> , <i>F. exasperata</i> , high <i>Chlorophora</i> , <i>Pteleopsis díptera</i> , <i>Pterocarpus tinctorius</i> (dense humid caducifolia florest); <i>Hyparrhenia sp</i> , <i>Andropogon sp</i> , acid <i>Hymenocardia</i> , <i>Nauclea latifolia</i> , <i>Annona arenaria</i> (savanna of the guinean type).

DEMOGRAPHY

The province of Kwanza Norte is constituted by 10 municipal districts with a average population density of 104,08 hab/km², being Cazengo the municipal district that presents the largest population density (7 439 hab/km²), followed by Ambaca (2955 hab/km²) and by Kiculungo (1862 hab/km²).

Municipality	N ^{er} de inhabitants	Territorial Extension (km ²)	Population Density
Cazengo	129664	1793	7439
Lucala	15443	1718	899
Cambambe	65169	5212	1250
Golungo Alto	24207	1989	1217
Samba Caju	34334	2485	1382

Ambaca	61680	2087	2955
Gonguembo	5359	1400	1383
Banga	8837	1275	693
Kiculungo	7111	382	1862
Bolongongo	13498	1016	1329
TOTAL	365.302	19.307	194,08

ECONOMICAL ACTIVITIES.

The main economical activities are: agriculture, production/extraction of wood, livestock and mineral extraction (iron and manganese).

The main crops are: cassava and sweet potato. In 2006 about 80,000 families farmers worked in the agriculture sector.

HEALTH

<i>Main illnesses</i>	Malaria, acute diarrhea , tripanossomiasis and tuberculosis
Medical staff	0,78 doctors/10 000 inhabitants 27,34 nurses/ 10 000 inhabitants

EDUCATION

<i>N^o of un-schooled children</i>	15.744 children out of the education system, being 8.185 in the urban areas and 7.559 in the rural area.
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INFRA-STRUCTURES

<i>Water and sanitation</i>	The existent equipment is currently obsolete in most urban areas.
<i>Electrical energy</i>	The existent equipment is obsolete in all of the urbanized areas. The hydroelectric plant of Cambambe (for energy supply in the province) was rehabilitated however the transport and distribution systems they are degraded or inoperative.
<i>Communications</i>	Roads: the roads are degraded, needing urgent intervention. National road to Malange is to be paved (still lacking about 60 km from close of N'Dalatando to Lucala). The Lucala-Camabatela section was partly landfilled, but it is still degraded. All the remaining ones are degraded. Aerial: N'Dalatando airport (inactive) and degraded unpaved tracks (remaining municipal districts). Rail: The Luanda Railway is under rehabilitation, until 2008, along the section that crosses the

	<p>province. It is intention of the Government to prolong the Dondo-Capanda section. Telecommunications: Telephone and mobile phone (just in the municipal district of Cazengo and Cambambe).</p>
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CULTURAL HERITAGE

<i>Main etnolinguistic groups</i>	Mbundu or Ambundu (sub-groups Ngola or Nginga, Akwa-Mbaka, Mahungo, Luango, Dembo, Kisama and Libolo), Ovimbundu and Bakongo.
<i>Predominant languages</i>	Portuguese and kimbundu.

Suspected Mined Areas

MUNICIPALITY	NUMBER OF SUSPECTED MINED AREAS
PROVINCE OF KWANZA NORTE	114
Banga	2
Camabatela	6
Lucala	7
N'Dalatando	31
Quiculungo	2
Quilenda	28
Cambambe	53

PROVINCE OF LUANDA



GEOGRAPHICAL SITUATION

Luanda is the capital of the Republic of Angola, is limited at west by the Atlantic ocean and at East by Bengo. It is the smallest province with about 2418 km².

CLIMATE

Tropical dry	Precipitation between 350 (coast) and 700 mm (interior) Average annual temperature of 25 to 26 °C Thornthwaite Classification: Megathermic climate
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GEOLOGY

Two great geological units exist: one includes the rock and crystalline formations of the “Maciço Antigo” (lower Archaic and Proterozoic) and the other, includes the sedimentary group.

Near Ambriz, the rock and crystalline formations follow the maritime coastline, becoming wider towards southeast through Caxito, until Dondo. The majority of the formations show a high level of metamorphism, being included in the “Complexo de Base”, and the gneiss, paragneiss, migmatite, micaschist and the granite-gneiss are the most abundant rock materials.

The majority of the studied area is included in the Kwanza river basin, in which lower Cretacic to Holocenic deposits outcrop, being the Cretacic deposits included in the interior strip of the basin, in contact with the “Complexo Rochoso Cristalino” and the Holocenic deposits are included in the coastal strip.

The lower Cretacic rocks are in general composed by “grés” or conglomeratic “grés”, with calcareous interseam, specially dolimitic calcareous or calcareous marls layers.

The upper Cretacic is widely represented in the Kwanza river basin. The marls deposits and ochre and red gypsiferous marls with calcareous interseams are the most abundant rock formations.

The Eocenic deposits outcrop in a wide strip that extends from the Kwanza river to the Dande river mouth. The medium and upper Eocenic are the most represented, composed by calcareous marls. The medium part of the sedimentary basin is composed by Oligo-Miocenic rock materials, being the marls the most abundant, specially the clayed ondes with gypsiferous interseams with a brown or grey to blue color and calcareous marls, that outcrop in wide extensions.

The upper stages of the Miocenic, represented by an alternation of sand and marls calcareous layers, outcrop in several locations. The formation shows at the top a stratified horizontal stratum of shell limestone, visible in the base of the scarp that separate the recent formations.

The Pleistocenic sand cover formations “Areias Vermelhas dos Musseques”, with great amounts of quartzitic materials that covered the first peneplain of the Oligo-Miocenic, have large representation between the Kwanza and Bengo rivers, form the Luanda plateau.

The Holocenic deposits have wide representation in the valleys of the most important rivers, such as Kwanza, Bengo and Dande, in correspondence with the Kwanza sedimentary basin. Along the coast, narrow strips of coastal deposits exist, that become wider in the rivers of the mouth of the rivers.

HYDROGRAPHY

Bacia sedimentar do rio Kwanza	The main rivers that drain sediments to the coast, Dande, Bengo and Kwanza, have wide and levelled base valleys, flowing trough alluvial plains, that close to the mouth of river, form wide wetland areas and big lagoons, that play an important role in the regulation of the flow rate. Some narrowing on the river’s mouth makes impossible exit of the waters, caused by the action and orientation of the cold Benguela’s current that also cause the formations of sand flats.
Complexo de Base	The main rivers cross part of the coast peneplain, form large valleys, but do not form accentuated slopes. They are residual relieves in the southeast limit and in some areas of the interior outlying limit, as a result of gradual move back of the sharp surfaces and progression of the inferior peneplain towards in east. The hydrographic net is relatively dense, but just the main rivers that have origin in the valleys of the interior, and flow directly to the sea, have permanent flows.

ECOLOGICAL ASPECTS

<i>Areas of ecological interest</i>	The “Reserva Integral do Ilhéu dos Pássaros” (Ilhéu dos Pássaros Integral Reserve), located in the Mussulo Bay, require further protection actions.
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<i>Fauna</i>	The fauna was strongly affected by the hunt and habitat destruction, remaining few animals, such as herbivores as predators, but it is still possible to find large population of birds (mainly in the forest galleries along the rivers), reptiles (crocodiles) and mammals (manatees, gulungos).
<i>Flora</i>	As for the fauna, the primitive vegetation cover of Luanda is completely altered, by human pressure. Currently, is possible to identify distinctive vegetation covers: in the “musseques”, grass formations with bushes and trees; in the “catetes”, sempervirent forest and marshy grasslands.
	The dominant species are: <i>Eragrostis superba</i> , <i>Schizachyrium semiberbe</i> , and <i>Digitaria milangiana</i> with bushes, with dominant species of <i>Combretum camporum</i> , <i>Strychus floribunda</i> , <i>Boscia vicus</i> , <i>Carissa edulis</i> and above this stratum the <i>Euphorbia conspicuous</i> ("musseques") and <i>Cyperus papyrus</i> , <i>Echinocloa sp</i> and <i>Tipha capensis</i> (marshy grasslands of the "catetes").

DEMOGRAPHY

The province of Luanda is constituted by 9 municipality districts with an average population density of 1997,8 hab/km², being Sambizanga the municipal district that presents the largest population density (37291,9 hab/km²), being followed by Cazenga (30363,9 hab/km²), Rangel (28140,6 hab/km²) and Maianga (22282,3 hab/km²).

Municipality	N ^{er} of inhabitants	Territorial Extension (km ²)	Population Density
Cacuaco	440.968	571,8	771,2
Cazenga	1.178.123	38,8	30363,9
Ingombota	181.222	9,6	18877,3
Kilamba Kiaxi	815.467	64,1	12721,8
Maianga	550.373	24,7	22282,3
Rangel	177.286	6,3	28140,6
Samba	271.286	345,4	785,43
Sambizanga	528.799	14,18	37291,9
Viana	686.608	1343,5	511,1
TOTAL	4.830.132	2417,7	1997,8

ECONOMICAL ACTIVITIES

Luanda is the political, economic, social and cultural centre of the Country, where are also located the headquarters of the main public and private companies of Angola.

The main activities are the trade (services), the industry (alimentary, construction materials) and the

informal trade.

HEALTH

<i>Main diseases</i>	Crescent appearance of "developed world" diseases, as hypertension, diabetes, cardiovascular diseases, besides epidemic diseases due to the bad sanitation conditions and deficient access to drinking water.
<i>Health infra-structures</i>	General hospitals (6), medical centres (35), health centres (60) maternities (1), maternity rooms (10), nutritional clinics (7) recovery and private clinics (about 100).
<i>Medical staff</i>	2,03 doctors/ 10 000 inhabitants 20,19 nurses/ 10 000 inhabitants

INFRA-STRUCTURES

<i>Water and sanitation</i>	<p>There are three water supply systems (Kifangondo I, Kifangondo II and the system of Kikuxi) and the respective treatment stations.</p> <p>About 25 holes implanted by ONGs exist in several municipal districts that are managed by the local communities.</p> <p>They are several investments in the water supply sector and it is foreseen that until 2008 about 60% of the population would have access to drinking water.</p> <p>The Luanda sanitation system was installed in 1940-1950 and is it totally obsolete.</p> <p>The new director plan provide the rehabilitation of the storm water and waste water systems, the rehabilitation and preservation of the main drainage systems and its new structural design for a 20-30 year-old perspective.</p> <p>The operation and maintenance of the reception systems, treatment, supply and distribution of water in regime of public service, as well as the accomplishment of studies and projects is under the responsibility of the Public Company of Waters of Luanda (EPAL-EP).</p>
<i>Eletrical energy</i>	<p>The electricity in Luanda is supplied by the hydroelectric plants of Capanda, Cambambe and Mabubas, that are insufficient for the demand, mainly Capanda, due to transport and distribution problems.</p> <p>It also exist a gas turbine, and thousands of generators that work as alternative sources in most of the companies, services and in a lot of houses.</p> <p>The distribution systems are located in Cuca, Viana, Cazenga, Nova Vida, Ngola Kiluanje, Congolenses, Mutamba, Golfe, Catete and Zango.</p> <p>The operation, maintenance and administration of the electrical energy distribution in Luanda are under the responsibility of the “Empresa de Distribuição de Electricidade de Luanda” (EDEL-EP).</p>
<i>Communications</i>	<p>Roads: Rehabilitation of the streets of several municipal districts, construction of the road Luanda-Viana and of the highway Benfica-Viana-Cacuaco.</p> <p>It is equally in course, the implementation of a new traffic system and multiservice stations.</p> <p>Aerial infrastructure: “4 de Fevereiro” International Airport (Luanda).</p> <p>Railway: The Luanda railway is operational between the stations of the Baixa and Viana (about 30 km).</p> <p>Ports: Port of Luanda has 2.738 meters of docks, divided into four great terminals operated by private companies, under contract (Terminal de Carga Geral, Terminal de Contentores,</p>

	Terminal Polivalente e Terminal Petrolífero). Telecommunications: Telephone and mobile phone, television through satellite and internet (broadband).
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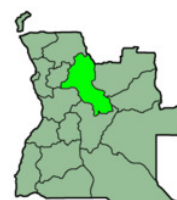
CULTURAL HERITAGE

<i>Main etnolinguistic groups</i>	Mbundu or Ambundu, Ovimbundu and Bakongo.
<i>Predominant languages</i>	Portuguese, kimbundu, kikongo and umbundu.
<i>Physical heritage</i>	92 classified monuments such as churches, public and private buildings, fortresses, architectural groups and others.

Presumably Mined Zones

MUNICIPALITY	NUMBER OF PRESUMABLY MINED ZONES
PROVINCE OF LUANDA	1
Viana	1

PROVINCE OF MALANGE



GEOGRAPHICAL SITUATION

The province of Malange is located in the north of Angola, making boarder with the provinces of Uige, North and South Qwanza , Lunba North and South and Bie' and still with the Republic of Congo. Malange has an area of 82 570 km², that corresponds to about 6,6% of the Angolean territory.

CLIMATE

<i>Lower Cassange</i>	<ul style="list-style-type: none"> • Precipitation between 1200 and 1300 mm • Average annual Temperature 23 to 24 °C • Relative Humidity 70 to 80% • Classification of Thornthwaite: Sub humid Climate (C₂) by north, and humid (B₁) by south
<i>Plateau of Malange</i>	<ul style="list-style-type: none"> • Precipitation between 900 (West), 1200 (East) and 1400 mm (North) • Average annual temperature 21 to 22 °C • Classification of Thornthwaite:Climate Mesothermic, sub-humid , humid (C₂) between the river banks of Cuanza river and Lucala, evolving to the area of Malange, and humid (B₁ e B₂) in the rest of the area
<i>Upper Kwanza</i>	<ul style="list-style-type: none"> • Precipitation between 1100 and 1300 mm • Average annual temperature 20 to 22 °C • Relative humidity greater then 60% • Classifiication of Thornthwaite: Humid mesothermic climate (B₁ e B₂)

OROGRAPHY

The Province of Malange, inserted at the plateau of Angola, presents three great different areas: the Drop of Cassange, that occupies the whole Northeast; the Plateau of Malange that occupies the area to north of the river Cuanza to the scarp that limits the Drop of Cassange and to This and South of the province the High Kwanza.

The Drop of Cassange occupies the whole Northeast of the Province, growing second a wide strip

in the sense NW-IF, forming an extensive peneplanitude, quite lowered in relation to the whole surface older planáltica than it surrounds her, getting the dividing scarp to present medium unevenness of the order of the 300/400 meters.

The Plateau of Malange becomes complete in an immense peneplanitude, that grows starting from the river Kwanza and he/she extends for North, tends continuity for besides the limits of the Province, in the call plateau of Camabatela, where the quotas went rising reach its maximum values of 1 300-1 400 meters.

High Cuanza, corresponds to an immense defined peneplanitude for the river Kwanza and for his/her great tributary the river Luando, of soft relief, where they mark per times extensive low plains. The peneplanitude dropped smoothly for north, oscillating the altitude to the turn of 1520 m in the south end, for 1070 meters in the confluence of Luando with the Kwanza.

GEOLOGY

<p><i>Lower Cassange</i></p>	<p>The surface depression of Cassange is cut in crystalline and sedimentary rocks of the Archaic and Lower Proterozoico, and mainly in more recent sedimentary formations largely attributed to Supergrupo Karroo. Powerful sandy sediments of the Tertiary and of the Quaternary they covered again the oldest formations in several places, mainly in the north part.</p> <p>Rocks of the crystalline punch, belonging to the Compound of Base, surface in it is worth of the river Cuango giving origin the frequent ones fast, being of the type gnaisses, granites and anfibolitos.</p> <p>Of upper Proterozoico they are only represented two groups of Westerner Congo Supergroup, the group Schist-limestone and Schist-Gresoso. They are better acted, mainly to west and northwest, constituting in that area great part of the scarp surface, that is cut there abruptly. The residual reliefs that they rise of the peneplanitude are formed by these formations that begin for a conglomerate and it finishes in powerful strata of grés arcosico, usually of color very reddish in characteristic.</p> <p>However, a great part of the surface that constitutes the Drop of Cassange is dominated by formations of Karroo, of superior Permico-Jurassic age. Here they are represented the Grupos Lutôe and Cassange. The first is distributed along the valleys of the rivers Lui, Lutôe and it Bleats, being in the base constituted by a tilito, to which layers are proceeded schist-gresosas and in the top loamy schists. The Grupo Cassange constitutes the most extensive formations and where it largely meets slice the imposing scarp, being of nature gresosa, xistosa or even cleyed . Its colour is a reddish charecteristic and the quite varied mineralogical constitution, being the grés micaceos, loamy grés, grés quartzíferos and the grés with calcareous cement, the more frequent rock types.</p> <p>Of continental Cretacico, in the Drop of Cassange the formation is represented by Calonda, correlated with the formation Kwango, that presents in the base a conglomerate the one that fine grés of purplish coloration are proceeded, with argilitos collations and of conglomerate. The largest representation of this complex gresoso-conglomeratic is verified to northeast and north, constituting the line of scarps of Brito Godins-Cuale-Carioca, as well as the abrupt hillsides that define its worth of the valley, in the area of Marimba.</p> <p>To Calonda the formations of grés polimorfos of the inferior and medium (Kalahari inferior) Tertiary are followed that were covered largely for extensive mantles of sands eolics of superior Kalahari, whose deposition would have verified in Pliocénico. Such formations, in the drop of Cassange are very well acted to North and Northwest.</p>
<p><i>Plateau of Malange</i></p>	<p>There are rocks of the Compound of Base along a central strip AND-W, involving to occident great part of the basin of the river Lucala, of metamorphic nature, mainly gnaisses, migmatitos and granite-gnaisses, with abundant veins of quartz. The largest representation falls to the old sedimentary formations, attributed to superior Proterozoico, corresponding to the Group Schist-Gresoso, more</p>

	<p>recent formations of Congo Westerner Supergrupo, constituted by grés and conglomerate of colors red or rosy and still for arcoses, grauvaques, loamy schists and schists siltosos. The grés are the rocky materials that occupy more extensive areas.</p> <p>In the northeast song of this area, they ponder several covered surfaces for rude deposits no consolidated of sands of Kalahari (superior Tertiary and of Plistocénico) that occupy great extension, tends continuity a lot for besides the limits of the area, being his/her limit to very defined AND-NE for the scarp of the Drop of Cassange.</p>
<i>High Kwanza</i>	<p>And they are the formations of the Compound of Base that happen in the western bordering strip N-S., constituted by gnaisses and granite-gnaisses. Already in the north part, of superior Proterozoíco, belonging to the Group Schist-Gresoso of Congo Ocidental they happen consolidated sedimentary rocks, no or little metamorfisadas, constituted by grauvaques, loamy schists and rude arcoses of purple characteristic coloration. As covering formations, consolidated or no, occupying extensive areas to north and in the periphery E_SE of the area, rocks that they are included in Supergrupo Karroo that are prolonged for the Drop of Cassange, happen and that constitute the group Cassange.</p> <p>In the strip East the covering formations that later have continuity for the interior of the country, they are constituted by the formations of Kalahari, in the base designated by the subgroup of the "grés polimorphics" and in the top for the "sands ochers."</p>

HIDROGRAPHY

<i>Lower Cassange</i>	<p>The peneplanítude depressionaria of Cassange can be subdivided in two levels. The first that he/she grows for besides the base of the great scarp, it is truly a foot surface, of quotas understood among the 800-1000 meters, of very wavy relief, alternating per times with softer areas. It is the dissected part of the Drop of Cassange, that the rivers cross fast, defining numerous interflúvios. The other surface is followed that of the foot, occupying among 600-700 m. In this the relief is much softer and in her they become complete the courses medium and lower of the important rivers that they cross (Uamba, Lean, Luanda and Lui) her, constituting extensive leveled areas. Such vast aplanção seems to constitute an extensive penetration of the peneplanítude pliocenica that progressed for south due to the erosion remontante of the central part of Congo provoked by the nets hidrograficas of the Lui.</p>
<i>Plateau of Malange</i>	<p>Under the physiographic point of view the Plateau of Malange becomes complete in an immense peneplanitude, that grows starting from the river Cuanza and it extends for north, tends continuity for besides the limits of the Province, in the call plateau of Camabatela, where the quotas went rising reaching its maximum values of 1300-1400 meters. This surface seems to constitute the older regional levelling, above which any indicative relief forms of the existence of other primitive surfaces of erosion are not observed. To East and northeast, the plateau is interrupted abruptly by an important scarp that, at inferior level it marks the limit of the Drop of Cassange.</p> <p>In the western part, it is another great geomorfologic unit, separated from the surface superior plains also for a scarp that in some places have unevenness of the order from the 100 to 150 meters. The rivers when transposing it originally falls spectacularly, as the one of the river Lucala, in Kalandula, or they win it through successive fast and waterfalls, as it happens to the river Lutete.</p> <p>With exception of the northeast part, that it drains to Zaire, the whole area is included in the Basin of the river Cuanza, with an important one tax, the river Lucala, that plays an important paper in the model of the landscape. Like this, for amount of the falls of Kalandula, the whole hydrographic net, is of permanent flow, circulating the rivers very slowly in bottoms of it is worth of marshy base, forming intrigues, and where a lot of times beds are not defined. At that time of the rains, the low ones marginal they are easily flooded, staying like this for long periods.</p> <p>In the morphologic unit of inferior level, the hydrographic net is dense, but only the rivers that have origin in the highest levelling are of permanent flow. All the others are of temporary</p>

	regime, inclusively the most important as Zunguege and the Mucous, don't present low marginal along their courses.
<i>High Kwanza</i>	<p>It corresponds to an immense defined peneplanitude for the river Cuanza and for its great tributary the river Luando, of soft relief, where they mark per times extensive low plains, designated by "anharas", that during the time of the rains flood in almost all his/her extension.</p> <p>The peneplanitude dropped smoothly for north, oscillating the altitude to the turn of 1520 m in the south end, for 1070 meters in the confluence of Luando with Cuanza. In all its vastness no there is to sign the occurrence of residual reliefs.</p> <p>The hydrographic net is quite dense and of permanent flow, belonging in it totality to the basin of the river Cuanza. The rivers define are worth very open, with hillsides of soft slopes and very wide base levels, through where the waters circulate slowly, frequently in beds badly defined forming intrigues.</p> <p>Another important geomorfolic unit concerns the extensive plains algae or "anharas", that they happen in the south part, among the river Cuquema and Cuanza, more expressively to northeast, in the drops of Songo.</p>

ECOLOGICAL ASPECTS

<i>Areas of Ecological Interest</i>	<p>Due to the great biomas diversity and ecosystems, Malange is one of the areas with larger interest in ecological preservation.</p> <p>It exists in the province the National Park of Cangandala and the Integral Nature reserve of Luando. However there is already a lot and it intends the alteration of the statute of these two protection areas, passing the Reservation of Luando to the category of National Park and the Park of Cangandala to the condition of Regional Park.</p> <p>In spite of advisable any proposal doesn't exist for a protection area for the Drop of Cassange.</p>
<i>Wildlife</i>	<p>It exists a high biodiversity, result of the existence of several biomas and ecosystems, however the wildlife was afectada negatively for the hunt.</p> <p>There is a great concern relatively to the preservation of the Black Gigantical Palanca, Hippotragus níger variani, species endemica of Angola and only present in this area.</p>
<i>Forestry</i>	<p>Malange presents a high diversity florística.</p>
	<p>The dominant species are: In the Drop of Cassange, open forest of Brachystegia longifolia, Daniellia alsteeniana, Marquesia macrura, Berlinia giorggi and Julbernardia paniculata, of the caméfitas savanna with the presence of Ficus sp, Sterculia sp and still of the pseudo steppe (chanas and anharas) with the occurrence of herbaceous strata of Hyparrhenia sp, Tristachya sp, Andropogon sp and Themeda sp; in the Plateau of Malange, forest open of Brachystegia wangermeeana, B. Spiciformis, B. Tamarndoides, Isoberlinia angolensis and in the herbaceous substratum Hyparrhenia, several Cyperaceae, Marquesia macroura and Daniellia alsteeniana, associated the other arboreal ones, namely Berlinia giorgii, Parinari curatellifolia, Cussonia angolensis and Uapaca sp.; in the High Kwanza, "forest of Panda", constituted essentially by Brachystegia sp, Julbernardia sp, Monotes sp, Isoberliniasp, and African Burkea and communities marshy herbosas constituted by Cyperus papyrus, along the courses of water.</p>

DEMOGRAPHY

The province of Malange is constituted by 14 municipal districts with average population density of 7.7 hab/km², being Malange the municipal district that presents the largest density population 111,5 hab/km², being followed by Cacuso 6,44 hab/km² and Kaculama 6,41 hab/km².

Municipality	Nº of inhabitants	Territorial Extension (km ²)	Population density
Cacuso	41.765	6.439	6,44
Kalandula	35.528	7.351	4,83
Malange	261.925	2.349	111,5
Massango	14.008	7.918	1,76
Marimba	8.462	5.893	1,43
Kahombo	10.931	5.503	1,98
Kiwaba Nzoji	6.677	3.266	2,04
Kangandala	33.826	6.058	5,58
Kaculama (Mucá-ri)	13.516	2.108	6,41
Kela	12.600	4.791	2,62
Kunda Dia Base	13.006	3.317	3,92
Lukembo	37.027	10.869	3,40
Kambundi Katembo	35.686	6.851	5,20
Kirima	13.830	9.857	1,40
TOTAL	538.787	82.570	7,07

ECONOMICAL ACTIVITIES

The main economical activities are: agriculture, livestock, trade, tourism and diamonds exploration.

In 2006 they existed about 220 000 families farmers. The main cultures are the cassava and the sweet potato and corn.

HEALTH

<i>Main Illnesses</i>	Malaria, acute diarrhea diseases, sharp breathing diseases, tuberculosis, shistosomíase, tripanossomíase, measles and typhoid fever
<i>Health Infra-structures</i>	Hospitals (13, of the which only (97) 1 is in operation), health centers (36), centers
<i>Indicators</i>	0,75 doctors /to 10, 000 inhabitants 21,97 nurses /to 10 000 inhabitants

INFRA-STRUCTURES

<i>Water and sanitation</i>	<p>the rehabilitation project exists for construction of a new reception system, treatment and distribution of water financed by the World Bank, that foresees the installation of 41 km of distribution net</p> <p>All of the systems of water supply and sanitation of the other urban centers and populations find been paralyzed.</p> <p>Only in the municipal district of Malange they can be found 7.000 shallow wells that feed off the freatic sheet , open by initiative of the populations, but without the conditions of demanded protection..</p>
<i>Electrical Energy</i>	<p>The headquarters of Capanda supplies the city of Malange and of Cacuso and in the remaining municipal districts small generators exist about 90 KVA of potency.</p>
<i>Road transit</i>	<p>Road: the net of stays of Malange is constituted by 352 km asphalted, 1073 km of beaten earth and 647 km of trails and pathways.</p> <p>The rehabilitation of the highways includes the highway Kizenga-Malange-Caculama (incomplete), with asphalt, and a small one scoff terraplanado for Quela (27 km). Recently they were contracted for the rehabilitation projects and asphalt of the highways Caxinga-Mussolo-Kirima, Mussolo-Kambundi Katembo and Lombe-Kalandula, including the destroyed bridges.</p> <p>Aerial: airport (Malange) and tracks of beaten (remaining municipal districts) earth.</p> <p>Rail: The Road-of-iron of Luanda is not in operation, being foreseen by its Malange counterpart in 2008.</p> <p>Telecommunications: Telephony fastens (Malange) and mobile (Malange and Cacuso).</p>

CULTURAL HERITAGE

<i>Principais grupos etnolinguísticos</i>	<p>Mbundu or Ambundu (subgroups Swing, Songo, Akwambaka or Ambaca, Bondo or Bondista, Bângala and Mahungo), Cokwe, Nganguela, Umbundu and Kicongo.</p>
<i>Predominant Languages</i>	<p>Portuguese, Kimbundu, Kikongo and Umbundu.</p>
<i>Physical Heritage</i>	<p>Three monuments and classified buildings exist in the municipal district of Malange (Mission of Késsua), Kalandula (ruins of the old prison of Bragança's Duke) and Quela (ruins of the Fort of Kabatuquila) all dated of the XIX. century.</p> <p>They also exist buildings still not classified as the graves attributed to old kings or municipal district of Kahombo that its imports to have in bill..</p>

Presumably Mined Zones

MUNICIPALITY	NUMBER OF PRESUMABLY MINED ZONES
PROVINCE OF MALANGE	170
Cacuso	15
Calandula	9
Cangandala	20
Kahombo	11
Kiwaba–Ngozi	10
Kunda-da-Baze	3
Malanje	63
Massango	4
Mucari	16
Quela	9

PROVINCE OF MOXICO



GEOGRAPHICAL SITUATION

The province of Moxico is located at the interior east of Angola, being limited at Northeast by Lunda Sul, at East by Bié, at South by Kuando Kubango and at East by the Republic of Congo and Zambia. Moxico has an area of 210 051 km², that corresponds to about 16,8% of the Angolan territory total area.

CLIMATE

<i>Alto Zambeze</i>	<ul style="list-style-type: none"> • Precipitation between 1200 and 1400 mm. • Annual average temperature from 21 to 22 °C. • Average relative humidity greater than 60%. • Classification of Thornthwaite: Tropical humid climate (B1 and B2) and mesothermic
<i>Anharas do Moxico</i>	<ul style="list-style-type: none"> • Precipitation between 1250 and 1300 mm • Annual average temperature from 21 to 22 °C • Average relative humidity between 60 and 70% • Classification of Thornthwaite: Humid (B1) and mesothermic climate.
<i>Bundas e Luchazes</i>	<ul style="list-style-type: none"> • Precipitation between 1100 and 1200 mm • Annual average temperature from 20 to 21 °C • Average relative humidity lesser than 40% (June and July) • Classification of Thornthwaite: Tropical humid (B1) climate, mesothermic, with tendency for sub-humid humid (C2) in the southern limit

GEOLOGY

The rocky formations of the Solid Old are broadly dominant in the Alto Zambeze. Therefore the Compound of Base (Archaic and Proterozoico inferior), constituted by intensely metamorized rocks occupy extensive surfaces forming the plain of the Zambeze, being partly covered by sandy deposits of the Kalahari. All of the rocky formations of the Compound of Base surface outcrop beyond the mountainous scarp that delimits the solid of Calunda.

The upper Proterozoic is widely represented in the Alto Zambeze, constituting the Macondo's group formations, that could be correlated with the Congo Western Supergroup, that occupy wide surfaces, and extends beyond the South border. The dominant rocks of this group are several color schists, limestones and finally mica argillites, reaching a total thickness of 300-500 m.

The non consolidated continental deposits are broadly represented in the lower plains, that covered vast surfaces of the Angolan eastern region and in the Alto Zambeze, such coverings affect the gneiss formations, in the north and northeast, and the Macondo group, in the south.

Additionally, notable outcrop of rocks of the Karroo exists, from the Stromberg Group, that constitutes the most relevant relief of the Alto Zambeze solid. It can be subdivided in two subunits: The lower Stromberg, constituted by earthy deposits and upper Stromberg, constituted by vulcanites. This last formation occupies an extension of 170 km length by 25 km of width in the upper streams of the Macondo and Lufuige rivers, with some outcrops in the left margin of the Zambeze river. The rocks occur under the form of layers, sills and extrusive bodies, are represented by basalts, trachytes, dolerites and diabases.

The second important unit is the "Anharas do Moxico" that corresponds to impressive extension surfaces, constituted by vast plains of “herbosa” vegetation cover that become flooded during longer or shorter periods, annually. This unit extends for about 200 kilometres with N-S orientation and in equal extension in the orientation E-W, being crossed by some important rivers, but without introducing any outstanding alteration in the landscape.

HYDROGRAPHY

The hydrographic net of the area is totally included in the Zambeze river basin that has its headquarters in Zambia, and enters in the Angolan territory at 1163 m of altitude and through 300 km. It leaves to South to 1050 m of altitude, revealing the softness of the relief of the plain where it circulates, with wavy or almost plain surfaces, largely covered by a thick sandy layer. The river has several meanders, receiving in its right margin the tributaries Chifumage, Luena and Lumbala and it drains the area of the Alto Zambeze through a dense hydrographic net, of permanent flow. Luizalo is, after de Zambeze, the most important river in the area, flowing from east to west, almost without defining a valley and then, after the cascades, flow in a deep valley downstream, to the Zambeze plain.

ECOLOGICAL ASPECTS

<i>Areas of ecological Interest</i>	In Moxico the Cameia National Park exists, which is one of the most important national park in Angola, occupying an area of 14.000 km2.
<i>Fauna</i>	Several animal species, such as great mammals, birds and reptiles exist in the province and due to the presence of these great variety of herbivores, a lot of

	predators may exist, mainly lions, although they must have been severely hunted.
<i>Flora</i>	Most of the territory is constituted by open forest.
	The dominant species are: <i>Brachystegia</i> sp, <i>Guibourtia coleosperma</i> , <i>Cryptosepalumpseudotaxus</i> , <i>Pterocarpus angolensis</i> , <i>Albizia adianthifolia</i> , and <i>Dialium engleranum</i> (woody); <i>Erythrophleum africanum</i> , <i>Terminalia sericea</i> , <i>Strychnos</i> sp, acid <i>Hymenocardia</i> , <i>Combretum</i> sp, African <i>Burkea</i> and <i>Diospyrus</i> sp (bushes); <i>Simplex Loudetia</i> , <i>Tristachia</i> spp, <i>Aristida</i> spp and <i>Monocymbium</i> . Among rizomatosas, the dominant species are the <i>Parinari capensis</i> , <i>P. Pumila</i> , <i>Syzygium</i> sp and <i>Uapaca</i> sp ("anharas"); <i>Cryptosepalum pseudotaxus</i> , associated with <i>Brachystegia tamarindoides</i> , and <i>Guibourtia coleospermum</i> (Cazombo and dense forest); <i>Copaifera baumiana</i> and <i>Paropsia brazzeana</i> (bushes).

DEMOGRAPHY

The province of Moxico is constituted by 9 municipal districts with an average population density of 2.76 hab/km², being Luau the municipal district that presents the largest population density (19,9 hab/km²), being followed by Leua (13,4 hab/km²) and by Moxico (7,36 hab/km²).

Municipality	N ^{er} of habitantes	Territorial Extension (km ²)	Population Density
Alto Zambeze	46.678	48.356	0,96
Camanongue	39.110	2.783	14
Leua	38.849	2.899	13,4
Luacano	34.925	13.573	2,57
Luau	76.429	3.839	19,9
Luchazes	5.528	43.344	0,12
Luambala Nguimbo (Bundas)	10.598	37.817	0,28
Lumeje(Cameia)	21.972	18.441	1,19
Moxico	287.211	38.999	7,36
Total	561.300	210.051	2,67

ECONOMICAL ACTIVITIES

The main economic activities are agriculture (the main crops are cassava, massango/massambala, rice, bean, peanut, potato and sweet potato), fishing, exploitation of forestal resources (honey), cattle breeding (bovid, swine, birds and bovine)and trade, although with little expression. Close to 85 000 families are in the agriculture sector.

HEALTH

<i>Main diseases</i>	Malaria, acute diarrhea, respiratory illnesses, tuberculosis, schistosomiasis, trypanosomiasis, measles and typhoid fever.
<i>Infrastructures of health</i>	Hospitals (13, from which only one is operational), medical centres (36), health centres (97).
<i>Medical staff</i>	0,75 doctors/ 10 000 inhabitants 21,97 nurses/ 10 000 inhabitants

EDUCATION

<i>Children's out of the education system</i>	184 059 CHILDREN
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INFRA-STRUCTURES

<i>Water and sanitation</i>	A Project for the rehabilitation of the water supply and distribution systems of Leúa exists. The water supply system of Luena has been rehabilitated.
<i>Electrical Energy</i>	The electricity in the province is supplied by small thermic sources (20 a 150 KVA) with exception of Luena (1615 KVA).
<i>Communications</i>	<ul style="list-style-type: none"> • Roads: Moxico is one of the poorest in terms of infra-structures and they are very degraded (3 175 km of degraded roads and 134 bridges, from which 35% are operative). • Aerial: the Luena airport has been recently rehabilitated. Unpaved tracks exist in Luau, Cazombo, Lumbala Nguimbo and Cagamba. • Railway: The railway is inoperative. <p>Telecomunicações: Telephone and mobile phone (using a Democratic Republic of Congo operator)</p>

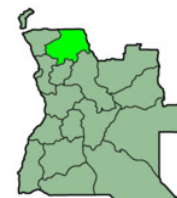
CULTURAL HERITAGE

<i>Main etnolinguistic groups</i>	Cokwe, Luvale, Mbunda, Ngangela, Luchases and Lwimbi.
<i>Predominant languages</i>	Portuguese and Cokwe.
<i>Physical heritage</i>	Kameia's fortification.

Presumably Mined Zones

MUNICIPALITY	NUMBER OF PRESUMABLY MINED ZONES
PROVINCE OF MOXICO	228
Alto Zambeze	129
Camanongue	19
Kameia	10
Luacano	17
Luau	99
Luchazes	17
Lumbala–Nguimbo	29
Leua	66

PROVINCE OF UÍGE



GEOGRAPHICAL SITUATION

The province of Uíge is located in the north of Angola, and it is limited at northeast by Zaire, at southeast by Bengo and Kwanza Norte, at southwest by Malange and at north and northwest by the Democratic Republic of Congo. Uíge has a surface area of 58,698 km², representing close to 21% of the angolan territory total area.

CLIMATE

<i>Dembos-Uíge</i>	Tropical wet with high temperatures, with alternation of dry and rainy seasons	<ul style="list-style-type: none"> • Precipitation between 900 and 1500 mm • Average annual temperature of 22 to 25C • average Relative humidity greater than 80% • Thornthwaite classification: sub-humid humid (C2) to humid climate, rainy (B1 and B2), megathermic (in the majority of the province) and mesothermic (in the interior periferic strip)
<i>Planalto do Congo</i>	Alternation of dry and rainy seasons	<ul style="list-style-type: none"> • Precipitation between 1300 mm (Maquela do Zombo) and 1600 mm (Negage) • Average annual temperature of 21 to 23C • Thornthwaite classification: humid climate (B1) and sub-humid humid (C2), mesothermic (northeast).
<i>Bacia do Cuango</i>	Tropical with high temperatures, with alternation of dry and rainy seasons	<ul style="list-style-type: none"> • Precipitation between 1400 mm and 1500 mm • Average annual temperature of 23 C (north) to 24C (south) • Average relative humidity greater than 80% • Thornthwaite classification: humid (B1), megathermic climate

OROGRAPHY

The province of Uíge include three main areas: Dembos-Uíge, Planalto do Congo and Bacia do Congo.

GEOLOGY

<i>Dembos- Uíge</i>	Vast representation of the consolidated sedimentary rocks of the upper Proterozoic, covering the Complex of Base formations in almost the whole extension. These are essentially sedimentary rocks, which make up the Western Congo Supergroup, being represented in the area the four groups that composed it (“Alto Chiloango”, “Xisto-Calcário” and “Xisto-Gresoso” groups).
<i>Planalto Congo</i>	Existence of two rocky formations: old sedimentary Proterozoic formations (western part of the area), that are included in the Western Congo Supergroup; and more recent sedimentary formations, that constitute the covering formations (that occupy the whole western surface with S-N orientation).
<i>Bacia Cuango</i>	Dominance of sedimentary covering formations .The sedimentary rocks belonging to the Kwango formation are largely dominant, which settle over the Karroo Supergroup formations (at south and southeast) and on the Western Congo rocks (at north and northeast). The Kalahari group formations, which sedimentary cycle took place from the lower Terciary (Eocenic) until the lower Pliocenic, are above the Kwango formation materials.

HYDROGRAPHY

<i>Dembos-Uíge</i>	This area is almost totally included in the hydrographic basins of three important rivers of the north of the country: Loge, Dande and Zenza. These rivers flow towards west, and form very defined open valleys, causing strong erosive events. The northeast and north strip of the area drains to the M'Bridge river, by its tributary, Lucunga and other tributaries that flow towards northeast. The south region is drained by the Lucala river, which belongs to the Kwanza river basin.
<i>Planalto Congo</i>	In the southeast part of this area, a surface that drains to the Cuanza river, integrated in the Lucala river basin develops, presenting smooth slopes, with very open valleys and wide marshy bases. In the north part, included in the Zaire river basin, the hydrographic net, as it flows downstream forms very open and defined valleys. The rivers have a great flow of water with linear courses and with sharp slopes in the end of the valley, as seen for the Cuilo river hydrographic basin, a Kwango river tributary. A small part of the zone, which is integrated in the Canda plateau (1000 m), drains to the M'Bridge river, until the Atlantic Ocean.
<i>Bacia Cuango</i>	The main hydrographic net, that divide the great streams is tight and of permanent flow, and it is whole integrated in the Kwango river basin, tributary of the Zaire river. The main rivers flow in the S-N direction, but successive captations in the north limit have diverted their courses towards east, causing them to drain directly for the Kwango river basin. The same can be seen in the Zadi river, a direct tributary of the Zaire, that is almost being diverted for the Kwango hydrographic net, via the Cuco river.

ECOLOGICAL ASPECTS

<i>Areas of Ecological Interest</i>	There is a proposal for the creation of the Reserva Natural Integral do Cuango .
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<i>Fauna</i>	<p>The fauna is rich in great mammals that show a high extinction risk, such as the elephant of the forest <i>Laxodonta africana cyclotis</i>.</p> <p>The population of primates is significant however, as their meat is very appreciated by the local populations, they experience a high extinction risk.</p>
<i>Flora</i>	<p>Dense and humid forest and semi-deciduous with some woody species of 20 to 30 m height (Cuango river area); dense forest sempervirent formations (river margins); open savanna and savanna with trees of 15 of 20 m height (Planalto do Congo); and savanna with trees with dense forest with valuable woody trees and grasses.</p>
	<p>The dominant species are: <i>Oxystigma oxyphyllum</i>, <i>Entandrophragma angolana</i>, <i>E.candollei</i>, <i>Combretodendron africanum</i>, <i>Albizia ferrugínea</i>, <i>Piptadeniastrum africanum</i>, <i>Sterculia bequaertii</i>, <i>Parkia filicoidea</i>; <i>Pseudospondias microcarpa</i>, <i>Lannea welwitschii</i>, <i>Irvingia smithii</i>; <i>Hyparrhenia spp</i>, <i>Loudezia arundinacea</i>, <i>Digitaria uniglumi</i>, <i>Smilax kraussiana</i>, <i>Landolphia lanceolata</i>, <i>Pteridium aquilinum</i>, <i>Cassia mimosoides</i> and <i>Abrus canescens</i>; <i>Marquesia macroura</i>, <i>Berlinia giorgii</i>, <i>Daniellia alsteeniana</i>, and <i>Parinari curatellifolia</i>; <i>Albizia gummifera</i>, <i>A.glaberrima</i>, <i>A.ferrugínea</i>, <i>Celtis zenkeri</i>, <i>C. Prantlii</i>, <i>Ficus mucoso</i>, <i>F. exasperata</i>, <i>Bombax reflexum</i>, <i>Sterculia purpúrea</i> and <i>Coffea canephora</i>; and <i>Mitragyna macrophylla</i>, <i>Clorophora excelsa</i>, <i>Canarium schweinfurthii</i>, <i>Loudezia arundinacea</i>, <i>Hyparrhenia diplandra</i>, <i>Tristachya spp</i>, <i>Anisophyllea fruticulosa</i>, <i>Carpodinus lanceolatus</i> and <i>Parinari pumila</i>.</p>

DEMOGRAPHY

The province of Uíge consists of 16 municipality districts, with an average population density of 19,97 hab/km², with Uíge having the highest population density, followed by Negage, Puri and Songo.

Municipality	N ^{er} of inhabitants	Territorial Extension (km ²)	Population Density
Uíge	250.920	1.349	186
Ambuila	24.866	4.799	5,18
Songo	102.970	2.729	37,73
Bembe	28.097	5.655	4,96
Negage	141.729	2.009	70,54
Bungo	36.164	2.155	16,78
Maquela do Zombo	111.450	7.734	14,41
Damba	86.982	6.915	12,57
Alto Cauale (Cangola)	24.039	3.062	7,85
Sanza Pombo	54.522	4.845	11,25
Quitexe	23.375	3.429	6,81
Quimbele	89.304	6.618	13,49
Milunga	21.690	2.300	9,43
Puri	57.000	1.153	49,43

Mucaba	82.918	1.072	7,74
Buengas	36.642	2.875	7,52
TOTAL	1.172.668	58.699	19,97

ECONOMICAL ACTIVITIES

The main economical activities are the agriculture and the informal trade, and very few industry, civil construction and restaurants.

The main agricultural crops are: cassava, beans, peanuts, wood extraction and drinks such as the malavu. In 2006, 262,000.00 families worked in the agriculture sector.

HEALTH

The health sector is characterized by the low sanitary cover and insufficient infrastructures, medical staff, hospital equipments and medicines, well as the lack of ambulances, and accumulation of patients in the existent units.

The epidemic situation is characterized by prevalence of infectious and parasitic diseases, namely malaria, trypanosomiasis, measles and more recently, the Marburg epidemic disease.

INFRA-STRUCTURES

<i>Water and Sanitation</i>	All of the water supply systems are currently degraded.
<i>Electrical Energy</i>	The dam close to the city is operational but has a low capacity, in relation to the population demand.
<i>Roads</i>	The province has close to 6000 km degraded roads and the Luanda-Negage road is currently under rehabilitated.

CULTURAL HERITAGE

<i>Main Ethnolinguistic Groups</i>	Bakongo, Ambundo and Ovimbundo
<i>Predominant Languages</i>	Portuguese, kikongo and umbundo

4 - THE ENVIRONMENTAL INSTITUTIONAL FRAMEWORK IN ANGOLA

This chapter presents the institutional framework in Angola concerning the Environment, making reference to the public entity responsible for defining and enforcing environmental policies as well as to other public entities concerned with environmental issues.

4.1 - MINISTRY FOR URBANISM AND ENVIRONMENT

This is the public entity responsible for the preparation, coordination, execution and supervision of the policies concerning management of the territory, urbanism, housing and environment, according to Decree-Law n.^{er} 4/2003, dated 9th May, which approved its statute (Article 1).

COMPETENCE

The Ministry of Urbanism and Environment (MINUA) must coordinate and supervise the actions of other ministries and public entities concerning the environment.

Their functions include namely:

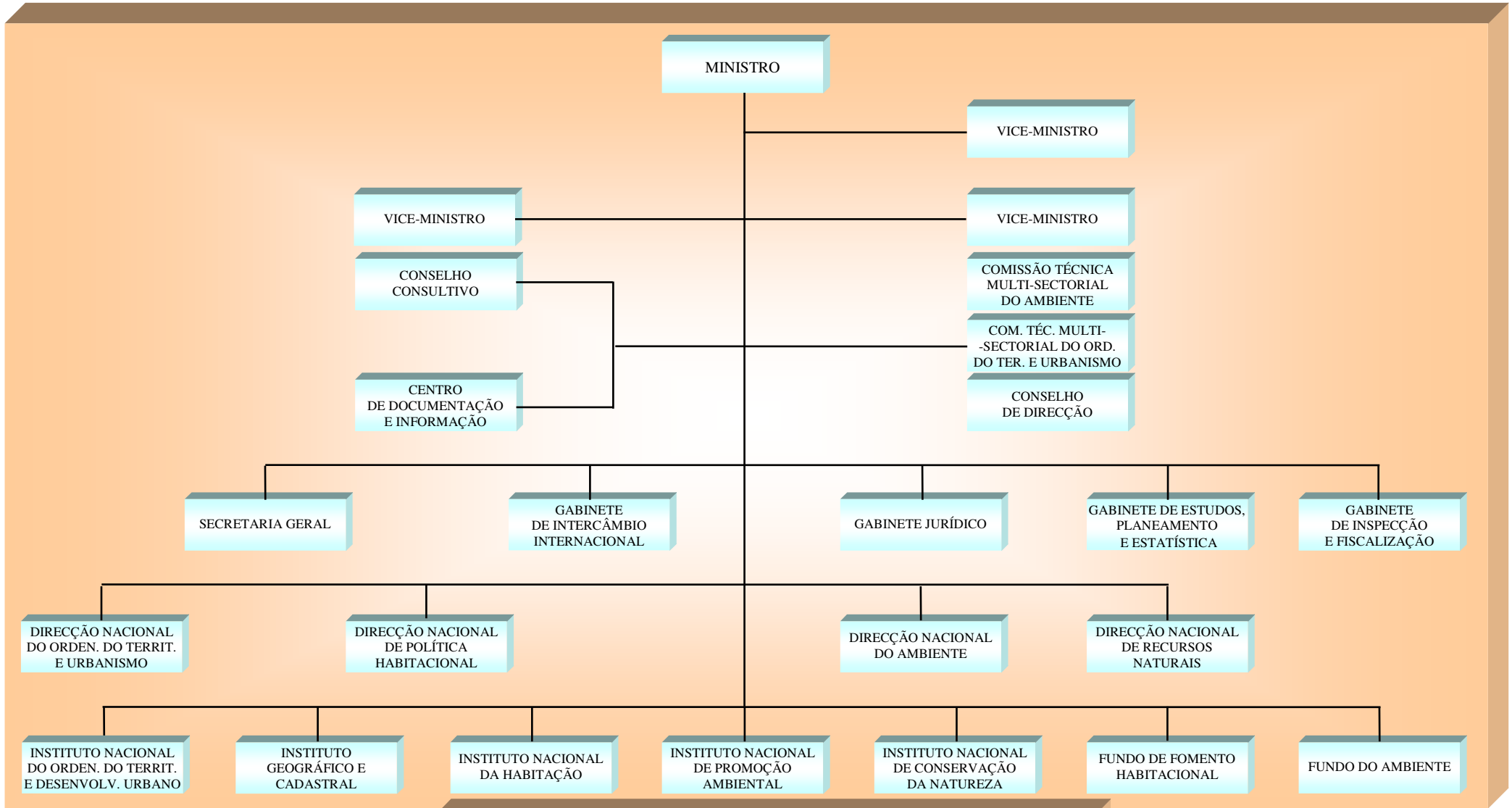
- To create conditions for promoting sustainable development in all sectors of national action, which respects environment as one of their basic foundations;
- To provide the preparation and implementation of policies and strategies for environmental preservation and management, nature protection and use of natural resources;
- To promote and develop sustainable development in all life sectors in Angola;
- To cooperate with other entities in all actions concerning the execution of environmental projects, in order to guarantee the respect for the legal requirements and regulations;
- To promote and support all activities of environmental protection and to stimulate national and foreign firms as well as the public administration to the use of clean technologies.

INSTITUTIONAL STRUCTURE

The organogramme of the Ministry for Urbanism and Environment is presented next.

National Directorate for Environment (“Direcção Nacional do Ambiente”), one of the central executive services of this Ministry, must carry on the functions referred to above, namely in what relates to environmental education, environmental management planning and environmental control of the activities which modify or pollute the environment,

through licensing, environmental impact assessment and environmental auditing, as well as to development of technologies and preparation of regulation proposals.



ORGANOGRAMME OF THE MINISTÉRIO DO URBANISMO E AMBIENTE

National Directory for Natural Resources (“Direcção Nacional dos Recursos Naturais”), another central executive service of this Ministry, has functions related namely to fauna, flora and endangered habitats protection, support to the constitution and management of units for nature conservation, recovery of degraded areas and cooperation with National Directorate for Environment in the control of activities for environmental protection.

The structure of the MINUA services was defined only four years ago, which did not enable yet the constitution of some entities like the National Institute for Environmental Promotion (“Instituto Nacional de Promoção Ambiental” or INAPA), the National Institute for Nature Conservation (“Instituto Nacional da Conservação da Natureza or INCN) and the Environment Fund (“Fundo do Ambiente”).

COORDINATION WITH ENVIRONMENTAL AGENTS

The constitution of a Multi-sectorial Technical Committee for Environment (“Comissão Técnica Multi-Sectorial para o Ambiente” or CTMA) shows the interest of the Angolan government to integrate environmental issues into sector policies. Decision n.^o 140/2001, dated 15th June, defines this Commission as the special service to provide hearing and specialized consultancy support to issues concerning environment and nature conservation, to be coordinated by the Ministry for Fisheries and Environment.

CTMA has a consulting character and its functions are namely (Article 1):

- To issue opinion about measures interconnected with several sectors related to sustainable development in all wide aspects of national life;
- To advice about law proposals concerning environment and sustainable use of natural resources;
- To articulate actions and programmes interrelated with several sectors designed for information, divulgation and social awareness, within the preparation of campaigns for environmental education, as well as recognition and protection of the basic communities in environmental matters;
- To issue opinion about strategies and actions which interconnect several activity sectors intending their cooperation and the cooperation at international level in environmental issues;
- To advice about the training of skilled professionals concerning environmental issues.

This Commission may coordinate environmental actions with the several activity sectors. Its chairman is the Ministry of Urbanism and Environment. The Commission integrates

representatives and technicians of the Ministries which activities influence the implementation of the environmental policy and management, representatives of MINUA, representatives of associations for environmental protection, recognized specialists and technicians in environmental and multidisciplinary issues, as well as representatives of the provinces named by the Ministry responsible for the environment.

At the provinces level, the Department for Environment (“Departamento do Ambiente”) may be inserted in several services. For instance, in Luanda province it belongs to “Direcção Provincial de Obras Públicas, Urbanismo e Ambiente” (regional services for public works, urbanism and environment), in Huambo province it is integrated in “Direcção Provincial de Urbanismo e Ambiente” (regional services for urbanism and environment) and in Malange and Bié it is a part of “Direcção Provincial de Agricultura, Pescas e Ambiente” (regional services for agriculture, fisheries and environment).

4.2 - OTHER MINISTRIES CONCERNED WITH ENVIRONMENT

According to its own statute and the Framework Law on Environment, MINUA has jurisdiction over environmental issues and biodiversity conservation; however, other Ministries have also functions concerning these issues.

So:

- Ministry for Agriculture and Rural Development has functions related to biodiversity conservation, forest management and promotion of rural development;
- Ministry for Fisheries has functions towards aquatic biological resources;
- Ministry for Energy and Water has functions in what relates to water resources;
- Ministry for Geology and Mines, Ministry of Oil and Ministry of Energy and Water have functions concerned with mineral resources.

MINISTRY FOR AGRICULTURE AND RURAL DEVELOPMENT

This is the entity which defines policies and strategies for promoting actions concerning agriculture, forests, cattle breeding, pasturing and coffee plants cultivation.

The most outstanding functions of the Ministry for Agriculture and Rural Development (MINADER) – which statute was approved by Decree-Law n.º 8/2003, dated 17th June – are the following:

- To prepare drafts for policies towards conservation and sustainable management of forest resources;
- To supervise the application of procedures for soils protection and utilisation;
- To register and to license fitofarmaceutical products, fertilizers, vaccines and drugs for veterinarian use, both national or imported, and control their use.

National Directorate for Agriculture, Cattle Breeding and Forests (“Direcção Nacional de Agricultura, Pecuária e Florestas” or DNAPF) – which statute was published by the Executive Decree n.º 52/2006, dated 17th April – has several functions like:

- To protect crops, animals and the territory of Angola against plagues and diseases;
- To provide technological support to the industries related to conservation and transformation of products and by-products of vegetal or animal origin;
- To supervise the application of procedures for soil protection and use;
- To register and to license fitofarmaceutical products, fertilizers, vaccines and drugs for veterinarian use and to control their use.

MINISTRY FOR FISHERIES

According to Decree-Law n.º 5/2003, dated 20th May, this entity must:

- Define the policy for conservation of halieutic resources and provide conditions to enable the effective protection of these resources;
- Collaborate towards nature conservation, mainly in what relates to the preservation of marine environment;
- Promote the development of viable plans for management of marine resources;
- Prepare the regulations required to enable the effective protection of the resources under its jurisdiction;
- Along with other entities, provide the supervision of fisheries in waters under the jurisdiction of the Angolan Government;
- Define, on a regular basis, the framework for resources management plans and for the programmes prepared for issuing fishing licenses.

MINISTRY FOR ENERGY AND WATER

According to Decree-Law n.^{er} 13/2000, dated 17th March, their functions include:

- To propose and promote the implementation of the policy regarding energy and water;
- To define strategies and to promote and coordinate the rational use of water and energy resources, providing their sustainable development;
- To propose and prepare legislation defining the legal and jurisdictional framework of the activity in the energy and water sectors, particularly regarding licensing, and to develop the required mechanisms to enable their supervision;
- To license and inspect dams and systems for water supply and sanitation;
- To establish procedures to ensure the quality of services for water and energy supply.

MINISTRY FOR GEOLOGY AND MINES

Its statute was approved by Decree-Law n.^{er} 10/2002, dated 30th August. Some of its functions include providing the protection and valorisation of mineral resources, through following and control of all the firms and entities which explore those resources or develop mining and geological activities.

MINISTRY FOR OILS

Its statute was approved by Decree-Law n.^{er} 10/96, dated 18th October. Some of its functions include licensing and supervision of oil industries for refining and petrochemical activities and for environmental protection and pollution control. A Department for Environmental Protection exists at the National Directorate for Oils (“Direcção Nacional dos Petróleos”).

The environmental management structure in Angola is still quite fragile and the institutional units to support policies and actions need to be strengthened in human and logistic resources and to undergo more intensive regionalisation, in order to be able to cope efficiently with the requirements of the vast territory of the country and of its enormous potential in natural resources and biodiversity.

5 - ENVIRONMENTAL LEGISLATION IN ANGOLA

Relevant legislation on environment has been published since the end of the 90's. Special references have to be made to the approval – in 1998 – of the Framework Law for Environment and to the ratification/approval of several Multilateral Agreements on Environment.

In the definition of the Development Objectives for the Millenium, presented in 2003 by the Government of Angola, two main objectives were proposed within the goal of “Providing Environmental Sustainability”:

- Integrate the principles of the sustainable environment into the national policies and programmes and stop the loss of natural resources;
- Reduce to half, until 2015, the percentage of people who have no sustainable access to drinking water.

The legislative efforts during the last years were directed mainly towards the integration of environment into the policies of the several activity sectors.

5.1 - MULTILATERAL AGREEMENTS ON ENVIRONMENT

CONVENTION RELATED TO FIGHTING AGAINST DESERTIFICATION

Angola subscribed this Convention in 1997 and is preparing its National Programme.

The main objective of this Convention is fighting desertification and/or mitigating drought effects. Each country affected by desertification or drought must then prepare National Programmes over Fighting Against Desertification. This Convention includes procedures about the utilisation of soils and forest and water resources and enhances the rights of local communities as a way to achieve land protection.

CONVENTION FOR BIODIVERSITY

Angola ratified this Convention in 1998 and approved its National Strategy and Action Plan for Biodiversity.

This Convention makes the States responsible for the conservation of their biodiversity and for the use of their biological resources and establishes rights and duties concerning the protection of that biodiversity.

PROTOCOL FOR BIOLOGICAL SAFETY

Angola ratified this Protocol in 2002 and is working on the definition of the respective national framework.

This Protocol intends to be a contribution to provide an adequate level of protection in what relates to safe transfer, handling and use of modified living organisms.

In 2004 the Government of Angola approved Decree n.^o 92/2004, dated 14th December, founded on the Cartagena Protocol for Biological Safety, which defines the control measures concerning import, entry, use and eventual production of genetically modified organisms in the national territory.

INTERNATIONAL TREATY FOR THE FITOGENETIC RESOURCES FOR FOOD AND AGRICULTURE

The purpose of this Treaty is the conservation and the sustainable use of genetic resources for food and agriculture, towards a sustainable agriculture and food safety. This Treaty was ratified by Angola in 2006 and engages its subscribers into the promotion of an integrated approach of the research, conservation and sustainable use of fitogenetic resources for food and agriculture, as well as into a fair and equal share of the benefits resulting from the use of those resources.

The Treaty emphasizes the importance of the definition of fair agricultural policies, of the reinforcement of the research to increase and preserve biodiversity, as well as of the amplification of the genetic basis of the crops to be made available to farmers and when possible of the promotion of a more intensive use of cultures, varieties and species under-used, local and adapted to local conditions.

OTHER LEGAL INSTRUMENTS SUBSCRIBED OR RATIFIED

The following relevant diplomas were ratified by Angola:

a) About climate:

- Framework Convention of the United Nations for Climate Change, ratified in 2000;
- Vienna Convention for the Ozone Layer, ratified in 2000;
- Montreal Protocol for the Ozone layer, ratified in 2000;

b) About other issues:

- Convention for the Protection of World Heritage, Cultural and Natural, ratified in 1991;
- Protocol on Energy (SADC *), ratified in 1997;

- Stockholm Convention on Persistent Organic Pollutants, ratified in 2005.

The following relevant diplomas were subscribed by Angola, but are not yet ratified:

- Protocol relative to Fauna Protection and Enforcement of the Law (SADC*), subscribed in 1999;
- Revised Protocol on Shared Water Courses (SADC*), subscribed in 2000;
- Protocol on Forest Activities (SADC*), subscribed in 2002.

* in the scope of the South African Development Community

5.2 - ENVIRONMENTAL LAW IN ANGOLA

(a) Main diplomas of broad character

The main diplomas relevant to ERMP integrating the national law framework, summarized below, are the following (by chronological order):

- Framework Law on Environment (Law n.^{er} 5/98, dated 19th June);
- Water Law (Law n.^{er} 6/2002, dated 21st June);
- Law for Territory Management and Urbanism (Law n.^{er} 3/2004, dated 25th June);
- Decree on Environmental Impact Assessment (Decree n.^{er} 52/2004, dated 23rd July);
- Law on Land (Law n.^{er} 9/2004, dated 9th November);
- Law on National Heritage (Law n.^{er} 14/2005, dated 7th October);
- Framework Law on Agricultural Development (Law n.^{er} 15/2005, dated 7th December);
- General Regulation for Territorial, Urban and Rural Plans (Decree n.^{er} 2/2006, dated 23rd January);
- Decree on Environmental Licensing (Decree n.^{er} 59/07, dated 13rd July).

FRAMEWORK LAW ON ENVIRONMENT (Law n.^{er} 5/98, dated 19th June)

This Law establishes the basic concepts and principles related to environmental protection, preservation and conservation, promotion of life quality and rational use of natural resources (Article 1), in agreement with the Constitutional Law of the Republic of Angola. It defines general and specific principles, objectives and measures, indicates the entities with functions in environmental management, reports to environmental protection measures, specifies the

rights and duties of citizens and identifies obligations, infractions and penalties, including an annex with relevant definitions.

Some outstanding aspects must be emphasized:

- General principles (Article 3): (a) the citizens right to live in an healthy environment and to benefit from the rational use of natural resources of the country, (b) the respect for the wellbeing of the population, for the protection, preservation and conservation of the environment and for the rational use of the natural resources and (c) the responsibility of the Government for the implementation of a National Plan for Environmental Management;
- Specific principles (Article 4): (a) training and environmental education, (b) participation, (c) prevention, (d) equilibrium, (e) unity of management and action, (f) international cooperation, (g) responsibility awareness, (h) valorisation of natural resources and (i) protection of genetic resources.

The principle of prevention must be emphasized, according to which all actions and interventions with immediate or long term effects over the environment must be considered previously in order to eliminate or minimize their eventual harmful effects.

Considering its wide scope, the following objectives must be emphasized (Article 5):

- To reach completely a sustainable development in all aspects of national life;
- To balance the satisfaction of the basic needs of citizens with the capacity of response from nature;
- To guarantee the minimum environmental impact of the actions required by the development of the country through a correct territory management and application of adequate techniques and technologies;
- To promote the enforcement of environmental quality regulations in all the productive sectors and in services sector, based on international regulations compatible with the reality of the country.

This diploma states the explicit obligations of the Government namely in what refers to:

- Publication of the regulations required by the application of the National Programme for Environmental Management (n.^{er} 1 of Article 11) and of the legislation regarding pollution control, as well as emission, storage, transport, import and management of gaseous, liquid or solid pollutants (n.^{er} 2 of Article 19);

- Definition of urban and non-urban quality standards related to noise and fuels combustion from industrial, agricultural or domestic origin (n.^{er} 3 of Article 19);
- Development of an environmental supervision system to control the enforcement of the environmental legislation (Article 30);
- Creation of incentives, either economical or of other nature, intended to encourage the use of technologies, of productive processes and of natural resources according to the spirit of Sustainable Development (Article 33).

By another side, in what concerns the duties of citizens:

- To participate into Environmental Management (Article 8);
- To use natural resources in a responsible and sustainable way whatever their purpose and cooperate towards the increasing improvement of life quality (Article 25).

Taking into account its specific interest for this Project, Article 15 contents are to be emphasized, according to which the implementation of infra-structures in the Territory of Angola which dimension, nature or location result in a significant impact over the natural or social environment must be submitted to a process of Environmental and Social Impact Assessment, which will define their social, environmental and economical feasibility as well as the methods for neutralising or minimising its effects. This process is the specific object of Article 16, which establishes it is mandatory for actions that may affect social and environmental equilibrium and harmony and defines the minimum contents of the environmental impact assessment studies to base them, postponing for a specific diploma the respective regulations.

It must be emphasized (n.^{er} 2 of Article 7) that the issue of an environmental license is based on the result of the Environmental Impact Assessment concerning the activity proposed and must be done previously to the issue of any other licenses legally required in each situation.

Besides, all singular or collective people who develop activities that may affect the environment classified in the legislation on environmental impact assessment, must have an insurance for civil liability (Article 27), disregarding the objective obligation of those who have caused damage for the environment, being or not guilty, through the duty of repairing the damages or paying a compensation to the State (n.^{er} 1 of Article 28).

WATER LAW (Law n.º 6/2002, dated 21st June)

The Water Law states the fundamental principles of the legal regime concerning the use of water resources (Article 1) and applies to inland waters, either surface or underground ones.

This diploma specifies (Article 3):

- a) Public water domain, general policy for its management and development, as well as the competences of the governmental institutions related to them;
- b) Framework of the legal regime of the activities for inventory, development, control, supervision, protection and conservation of water resources;
- c) Rights and duties of all the participants in water management and use.

Chapter II of Water Law refers to the General Principles of Water Management, defining the principles and objectives of water management (Articles 9 e 10), to the General Inventory and Water Balance (Articles 11, 12 and 13) and to the Coordination and Institutional Arrangements (Article 14 to 20).

In what concerns the uses requiring license or concession, dealt with in Chapter III – General Use of Water, Law establishes that water supply to the population, for drinking purposes and hygiene needs, has priority face to other private uses (Article 33–2) and that struggle arising from lack of water for meeting different objectives must be resolved taking into account the socio-economic profitability and the environmental impact of the respective uses.

Chapter IV of this Law concerns protection of water. According to Article 66, the protection against pollution of waters belonging to the public water domain envisages particularly:

- a) To get and maintain an adequate level of water quality;
- b) To prevent the accumulation in the sub-soil of toxic or hazardous compounds that may contaminate underground waters;
- c) To avoid any other action that may result in degradation of the water.

In general, the following activities are forbidden (Article 67):

- a) To discharge wastes that exceed the capacity for self-regeneration of the water courses, directly or indirectly;

- b) To accumulate solid waste, remains or other substances, in places and conditions that contaminate water or involve risk of its contamination;
- c) To practice any activities that result in pollution or endanger risk of pollution or degradation of the public water domain;
- d) To carry on any change in the regime, flow, quality and use of the water that may endanger public health, natural resources, natural environment or national safety and sovereignty.

Still in relation to prevention and control, the discharge of wastewater, faeces or other substances and any activities that may cause pollution or degradation of the public water domain require permission to be granted by the institution entitled to water resources management in the concerned hydrographic basin and other competent authorities (n.^{er} 1 of Article 68).

It must also be emphasised that the permissions for discharge must comply with modifications and constraints according to public and environmental needs and that their owners have the obligation to alter methods or technological processes resulting from those modifications and constraints (n.^{er} 3 of Article 68).

This Law also foresees the existence of regulations where water bodies are typified and where the quality standards for effluent discharge are defined, as well as the respective means of compensation (n.^{er} 2 of Article 68).

LAW FOR TERRITORY MANAGEMENT AND URBANISM (Law n.^{er} 3/2004, dated 25th June)

The purpose of this Law is the definition of the system for territory management and urbanisation and of the political action related to them (n.^{er} 1 of Article 1).

This Law identifies as the main objective of territory management the promotion of favourable conditions to ensure the general purposes of economical and social development, social well-being and protection of the environment and quality of life of the citizens (n.^{er} 1 of Article 1); some secondary objectives have to be outlined:

- a) To guarantee an integrated and rational improvement of the space use and favourable conditions to the development of economical, social and cultural activities, not disregarding the protection of the interests of the territory protection, internal security and equilibrium of the ecology and the historic-cultural heritage;

- b) To favour equal opportunities of access of the citizens to collective equipments and public services in urban or rural areas;
- c) To adequate densification levels of the urban communities to the capabilities of the infra-structures, equipments and services, existent or foreseen, in order to stop degradation of the life quality and prevent socio-economic rupture;
- d) To protect and improve the potential and life conditions of rural areas and create job opportunities in order to fix the populations to the rural environment;
- e) To preserve and protect soils with natural aptitude or used to agriculture, cattle-breeding or forestry purposes, introducing constraints to other uses whenever it is really needed;
- f) To protect the water resources, the riverine areas, the coastline, the forests and other places particularly interesting for nature conservation, compatible with the normal use of their specific potentialities by the population;
- g) To protect the natural and cultural heritage and value the landscapes resulting from human activities.

Article 1 – n.^{er} 2 emphasizes that the purposes of the territory management and urbanisation must harmonise with the environmental policies.

Article 14 is dedicated to the protection of the environment and other values, referring that the territorial plans must discipline the occupation and use of the territory, in a way that enables the preservation of the environment, the quality and organisation of rural and urban space, the landscape and the historical, cultural and architectural values of rural and urban communitarian life (n.^{er} 1 of Article 14).

Then, natural landscapes, biologically balanced, and those resulting from human intervention that are characterised by diversity and aesthetical harmony, as well as the socio-cultural systems they support, must be protected by the territory management tools (n.^{er} 2 of Article 14) and isolated or grouped buildings that are part of the landscape or represent historical value and contribute to add value to the space must be preserved by the territory management tools (n.^{er} 3 of Article 14).

This Law classifies territorial plans accordingly to their territorial scope – national plans, provincial plans or inter-provincial plans and municipal plans – as well as accordingly to the specific subject of the matters concerned – special plans and plans for activity sectors – and also accordingly to the nature of the space – rural management plans and urban plans.

Within the municipal plans, environmental management plans must be emphasized. This plans act as regulations and define the rules for protection of natural, environmental or other assets, as well as the procedures that citizens must follow for occupation and use of land from the natural reserves, in respect for the legislation about land property, environment and other relevant issues (n.^{er}. 6 of Article 31).

DECREE ON ENVIRONMENTAL IMPACT ASSESSMENT (Decree n.^{er} 51/2004, dated 23rd July)

The regime about Environmental Impact Assessment – defined as a procedure of preventive environmental management including identification and previous analysis, both qualitative and quantitative, of the good and harmful environmental effects resulting from a certain activity proposed (Article 3) – applies to all public and private projects that may be submitted to evaluation. Thos projects are the ones discriminated in the annex to the diploma, except those considered by the Government as having interest for national protection and security, which may be exempt of this procedure (Article 4 – 3). The projects referred to in the annex of the above diploma are:

1. Agriculture, Fisheries and Forests:

- a) Rural land consolidation projects;
- b) Projects to convert non-cultivated lands or semi-natural areas to intensive agricultural exploitation;
- c) Hydraulic projects for agriculture;
- d) Forestation and deforestation projects, whenever they can result in negative ecological transformations;
- e) Projects for industrial exploitation of forestry resources;
- f) Projects for starting big industrial units for aquaculture or for units that have sewage and wastes discharged into the watercourses;
- g) Recovery of land from sea;
- h) Irrigation projects.

2. Extractive Industry:

- a) Industrial and agro-industrial complexes or units
- b) Refineries of raw oil, oleoducts, gasoducts, mineroducts, main sewers and final outfalls for wastewater discharge;

- c) Deep shafts, excepting wells to study soil stability, namely: geothermal wells, wells for water supply, non-metallic ore extraction and large units for energy production;
- d) Oil extraction;
- e) Natural gas extraction;
- f) Metallic ore extraction;
- g) Open-sky extraction of neither non-metallic minerals nor energy producers;
- h) Mineral coal and lignite extraction in underground and in open-sky facilities;
- i) Cement manufacture plants;
- j) Extraction of fossile fuel;
- k) Ore extraction in large units;
- l) Installation and location of tailings and landfills;
- m) Installation and location of basins for waste settling;
- n) Installation and location of storage reservoirs for explosives used in mining operations;
- o) Installation of mineroducts and gasoducts;
- p) Installation of pipelines;
- q) Dams and other works intended to divert river flows;
- r) Plants for scrap storage from machines and mining equipment;
- s) Other specific plants for mining uses.

3. Energy Industry:

- a) Industrial plants for the transport of gas, steam and hot water;
- b) Surface storage of natural gas;
- c) Underground storage of combustible gases;
- d) Surface storage of fossile combustible;
- e) Industrial agglomeration for mineral coal and lignite;
- f) Plants for production and enrichment of nuclear combustibles;
- g) Plants for re-processing of nuclear irradiated combustibles;
- h) Facilities and equipment for collection and processing of radioactive wastes;
- i) Facilities for the production of hydroelectric energy with power over 1 000 kW;

- j) Lines for electric energy transport above 230 kV;
- k) Hydraulic works for exploitation of water resources;
- l) Nuclear plants for the production of electric energy over 500 kW;
- m) Nuclear plants for the production of electric energy using isotope fission.

4. Glass Manufacture;

5. Chemical Industry:

- a) Treatment of by-products and manufacture of chemical products;
- b) Manufacture of fertilizers, pesticides and fitofarmaceutical products, paints and varnishes, elastomers and peroxides;
- c) Storage facilities for oil and petrochemical and chemical products;

6. Projects for Infrastructures:

- a) Highways with two or more ways and motorways;
- b) Construction of medium and long range railways;
- c) Construction of tunnels;
- d) Harbours and terminals for ore, oil and chemical products;
- e) Airports;
- f) Projects for development of industrial zones;
- g) Projects for urban development;
- h) Construction of railways and facilities for inter-modal change and parking terminals;
- i) Dams and other works for retaining water or storing it on a permanent basis;
- j) Coastal works for erosion control and marine works intended to modify the coastline;
- k) System for abstraction and artificial feeding of surface water;
- l) Works for water transfer water between hydrographic basins.

7. Other projects:

- a) Permanent race tracks and training tracks for motor vehicles;
- b) Waste elimination plants;
- c) Wastewater treatment plants;

- d) Locals for sludge storage;
- e) Scrap storage, including automobile scrap;
- f) Facilities for essay of motors, turbines or reactors;
- g) Plants for manufacture of artificial mineral fibres;
- h) Manufacture, packaging, distribution or destruction of explosives;
- i) Plants for destruction of products unsuitable for feeding purposes;
- j) Sanitary landfills, processing and final disposal of toxic or hazardous wastes;
- k) Construction of incineration plants;
- l) Construction of cemeteries.

These projects must be accompanied by an Environmental Impact Assessment (EIA) Study to be submitted to the approval of the public entity with competence on the environmental issues (Article 4 – 1) and that must be presented by the Project Owner at the beginning of the administrative procedure for permission or at the beginning of the project licensing (Article 5 – 1); the Project Owner must pay for the respective expenses and costs, including costs concerning the execution of the public consultation (Article 8).

The diploma specifies the documentation that the EIA study must contain (Article 6) and the technical activities involved in it (Article 7).

Public consultation is mandatory and must be carried out by the Ministry responsible for environmental issues (Article 10). The appraisal from this entity – which has to be issued within a maximum of 30 days after reception of the required documentation (Article 12) – must be respected, no permission or license relating to the project being allowed if there is a negative appraisal of the Ministry concerning environmental issues (Article 13 – 1).

Some types of infractions are violation of the appraisal of the Ministry concerned with environmental issues and non-compliance with the recommendations presented in the EIA report (Article 16).

All activities dealt with by this diploma must be submitted to environmental audits that must be carried out by specialized entities duly authorized by the Ministry concerning environmental issues (n.^{er} 4 and n.^{er} 5 of Article 22).

The regulation of aspects like environmental licensing, environmental auditing and environmental supervision is being developed.

LAW FOR LAND (Law n.^{er} 9/2004, dated 9th November)

The objective of this Law is to establish the fundamental basis of the legal regime of land integrated into properties belonging initially to the State, of the land rights related to those properties and of the general regime concerning transmission, constitution, exercise and extinction of those rights (Article 2).

According to this Law, transmission, constitution and exercise of fundamental rights about lands which the State may release must respect several fundamental principles (Article 4), namely those inherent to the initial property of the lands by the State (integrated into their public or private domain), the non-transferable right of property of the natural resources by the State (integrated into its public domain) and the irreversibility of nationalization and confiscation of properties.

In the terms of this diploma, no one can be deprived of his right to property or of his limited land rights unless in the cases specified by the Law. The State and the local authorities may expropriate lands if they are to be used for a specific purpose of public utility (Article 12).

State may play a role in land management and in land concession according to the following objectives (Article 14):

- a) Adequate management of the territory and correct constitution, arrangement and functioning of urban agglomerates;
- b) Environmental protection and economically efficient and sustainable use of land;
- c) Priority to public interest and to economical and social development;
- d) Respect for the principles specified in this Law.

In what relates to concerns about environmental protection and land use, the Law refers that the occupation, use and benefit from the land must comply with norms referring to environmental protection, namely those related to landscape protection and to the protection of fauna and flora, to preservation of the biological equilibrium and to the rights of the citizens to a healthy and unpolluted environment (n.^{er} 1 of Article 16), which must be exercised in order not to compromise the capacity of regeneration of the arable soils and the maintenance of their productive aptitude (n.^{er} 2 of Article 16).

Land classification is made taking into account the intended purposes and their juridical regime deriving from the law (n.^{er} 1 of Article 19). Urban land is classified in urbanised land, construction land and land amenable to be urbanised (Article 21). Agricultural land is

classified by the competent authority according to the dominant crop in lands for irrigation land and lands not to be irrigated, the type of crop being considered as the most adequate to land aptitude and conservation and to the preservation of its capacity for regeneration (Article 24).

Reserves are defined as land excluded from the general regime of occupation, use or benefit by individual or collective owners, in function of the commitment to the concretization of the special purposes intended with its constitution (Article 27). In total reserves no use or occupation is allowed except those required for its own conservation or management; in partial reserves all forms of occupation are allowed if they do not agree with the purposes foreseen by the diploma that created them.

Partial reserves include namely (n.^{er} 7 of Article 27) the protection zone adjacent to water springs, the protection zone adjacent to dams and reservoirs, as well as the land occupied with several infra-structures – like, for instance, railways; roads; water, telecommunication, oil and gas mains; airports; military facilities – and respective adjacent zones.

If there are expropriations for public utility or restrictions according to this Law in the reserves, this Law states clearly that a fair compensation must always be paid to the land owners and to other right owners that will be affected (n.^{er} 10 of Article 27).

The public domain of the State includes, namely, territorial water and their respective living organisms, mineral resources, roads and public ways, public bridges and railways, beaches and the shoreline, as well as the territorial zones affected to environmental protection, to harbours and airports or to military purposes (Article 29). The classification of properties (which acts as a declaration of public utility within the expropriation process for public utility) or the disaffection of properties from the public domain are declared through a diploma issued by the Government or through a diploma which approves general plans for territory management (Article 31).

The State may transfer into local authorities any assets belonging to the public domain, the regime of the public domain of the State being applicable to those assets with some adaptations (Article 32).

LAW FOR CULTURAL HERITAGE (Law n.^{er} 14/2005, dated 7th October)

This Law defines the basis of the policy and of the system for protection and valorisation of Cultural Heritage which is considered relevant for the Angolan cultural identity.

Cultural Heritage is defined as the whole material or immaterial assets which must be submitted to law patronage due to its recognisable value, as well as any other assets that may be considered so by use and tradition and by international agreements subscribed by the Angolan State (Article 2). The State and the several hierarchic levels of the public administration, as well as the owners or people detaining any of their parts, institutions of all kinds and citizens themselves must proceed to inventory, study, protection, valorisation and public announcement of the Cultural Heritage (Article 4).

The legal protection of the material assets integrating the Cultural Heritage relies on the classification of those assets, mobile or not, in what relates to their nature and their value (Article 7).

The owners and keepers of assets already classified or almost classified must take into account the specific problems of heritage conservation in their policies of fighting against pollution at national and international level in order to limit the risks of physical degradation of the architectural heritage and must execute all the works that the competent Ministry considers necessary for their preservation (Article 14).

All the cultural assets must integrate a systematic and exhaustive inventory to be carried out by the competent services of the Ministry concerned (Article 17). Classified buildings must have always a protection zone defined according to the specifications of the Law for Territory Management and Urbanism, which is an administrative servitude; before its delimitation for each specific case, that zone may be considered as 50 m away from the external limits of the building and may include a zone where construction is forbidden (Articles 19 and 21). If the classified assets are in danger of misleading, loss or deterioration, the competent Ministry must define adequate measures to each situation (Article 24).

The archaeological assets, mobile or not (including archaeological testimonies discovered in submerged areas or brought by water) are considered national heritage (Articles 32 and 33). The execution of archaeological works referring to archaeological assets classified or almost classified or to their protection zones, as well as to non-classified buildings with archaeological interest require previous permission from the competent Ministry (Article 33).

The concept of Cultural Heritage includes namely natural heritage, defined as the physical formations and the biological species or groups of those formations or species that are valuable from the aesthetical and scientific points of view; the geological and physic formations and the clearly limited zones that are habitats to animal or vegetable species

valuable from the point of view of science and conservation; natural sites or zones with landscapes of exceptional natural beauty (Article 44).

Protection, conservation, valorisation and revitalization of Cultural Heritage are mandatory in territory management and in its planning at national, provincial or local level (Article 47).

FRAMEWORK LAW FOR RURAL DEVELOPMENT (Law n.^{er} 15/2005, dated 7th December)

This Law defines objectives related to the rational use of forestry resources and to the preservation of the patterns of its regenerative capacity, the increase of production and productivity and the preservation of the socio–economical balances in the rural world.

According to this Law, State is obliged, namely: to improve human resources through professional training of farmers and rural workers; to develop incentives for the direct exploitation of land and the fixation of young farmers; to create irrigated areas, forests and activities linked to the exploitation of forest and animal resources; to support the development of research, experimentation and rural divulgation (Article 3).

The main principles of this Law emphasize the importance of the application of methods of cultivation compatible with an economical and rational ecological use of the natural resources they are based on (Article 11) and recommends:

- Rational and correct use of soils with agricultural aptitude that may guarantee the conservation of its productive capacity and effective protection against erosion and chemical or organic pollution;
- Conservation and valorisation of the forestry heritage as an essential basis for sustainable rural development;
- Development of strategies to prevent contamination and pollution of underground and surface water, with the purpose of protecting water quality for the several uses to which it is intended for;
- Protection of biodiversity associated to flora and fauna.

GENERAL REGULATIONS FOR TERRITORIAL, URBANISTIC AND RURAL PLANS (Decree n.^{er} 2/2006, dated 23rd January)

These regulations apply to all plans of national, provincial or municipal scope, as well as to projects and programmes of public or private initiative to develop in the Angolan territory.

The national and the municipal special territorial plans must be outsized from the plans regulated by this diploma (respectively Articles 46 and 111), concerning namely:

- a) areas or parks of rural or forest reserves, including classification and qualification of soils and measures to their protection;
- b) areas or natural parks, for protection of wild flora and fauna;
- c) mining areas or parks for mining exploitation and production, integrating measures for environmental and natural resources protection and for protection of the rights of neighbour populations.

DECREE OF ENVIRONMENTAL LICENSING (Decree n.^{er} 59/2007, dated 13rd July)

This decree appears to be obligatory foreseen in the Framework Law of Environment (Law n.^{er} 05/98 of the licensing of the activities that, for his/her nature, place, dimension, origins environmental and social impacts, the aim of the present decree is to establish the requirements, criteria and administrative procedures regarding the environmental licensing of these activities (Article 3).

The request of environmental license will have the responsible entity to be driven for environmental policies, by application, after all they be accomplished from the formalities relatives to environmental impact assessment process (Article 5).

The request of environmental licensing should consist (n.^{er} 1 of the Article 6):

- a) description of the installation, nature and extension of activities";
- b) "certificate emitted by Provincial Government, declaring that the place and the installation or activities are in accordance with the legislation about the soil occupation";
- c) "non-technical summary of environmental impact assessment study";
- d) "highlighted opinion of the guardianship entity of the respective activity." The request of environmental license is given at the general office of the responsible entity for the environmental policies (n.^{er} of the Article 7).

Under penalty of the procedure not to continue, they can be requested by competent area of the responsible entity by the policies of the environment, complementary information, additions or the reformulation of the non-technical summary, for effects of conformity of the request (n.er 3 of the Article 7).

The decision of the request of environmental license is uttered in the period of 90 days, counting from the reception date and the request is considered been deferred if, elapsing the established period of time, decision didn't be uttered (n^{er}.1 and n^{er}.2 of Article 8).

As far as licensing is obligatory the construction, installation, the recovery, the rehabilitation, expansion, changes, operation and closure of activities that need of environmental impact studies remain subject to the previous environmental licensing." (Article 10).

The environmental license of installation precedes the operation, and it "has for purpose to authorize the implantation of the work au enterprise, in agreement with the constant specifications of the approved project for the entity of protection of the activity..." (Article 12).

Relatively license of operation this "is emitted after the observance of all of the constant requirements in the environmental impact study..."(Article 13). The environmental license of operation should consist in (Article 14):

- a) " the reference documents about the best methods and techniques applicable for licensing the activity and is inclusive of all necessary measures for the compliance of air protection, water and soil/earth, wildlife, forestry and the prevention or reduction of noise and wastes, with the aim of attain an acceptable target".
- b) "the values limit emitted during the operation of the activity;
- c) "the recommendations measures that guarantee adequate soil protection and of the underground waters, the control of noise and management measures for waste produced by works construction";
- d) "measures of monitoring emissions at works construction, including the methodology description to assure the verification of the execution of the conditions of the license"; and
- e) "measures of operation that can produce impacts for the environment"
- f) "obligation of informing the responsible entity for the policies of the environment, in the period of 24 hours, of any incident that affects considerably the environment":
- g) "period of validity of the license that cannot be inferior to three years, or superior to eight years."

The responsible entity for its policies of the environment should reject the request of environmental licensing when (Article 15):

- a) the work construction and/or activity operation doesn't obey to the demanded requirements, especially the technical conditions, the guidelines of prevention of the pollution, of hygiene and safety, as well as the urban planning and of the territory management ";
- b) "the work construction and/or activity operation may endanger the environment and public health";
- c) " to result of the environmental planning the installation and/or activity operation has as consequence the creation of pollution capacity above the demanded" minimum value:
- d) "didn't realize the environmental assessment impact that is demanded by the applicable legislation:

As the renewal of the environmental license, it should be renewed in the period as foreseen..."(ner 2 of the Article 16).

The temporary suspension of the environmental license by the responsible entity for its environmental policies is possibly, in certain specific cases (n.er 1 of the article 17). The extinction of the environmental license foreseen in the present decree can happen for caducity, resigns or repeal (Article 18).

They lack environmental license the activities in the following cases:

- new activities subject to environmental impact study (Article 20);
- existent activities, that in a period of two years starting from the entrance date of the present decree should request environmental licensing (Article 21);
- expansion or changes of facilities for effects of increase of the production or quality improvement (Article 22).

Previously to the emission of the environmental license of operation and accomplished an inspection undertaken by the responsible entity for the environmental policies (Article 24).

In that sequence the creation of a system of environmental consultants' registry in environmental assessment impact by the organism responsible for the environmental policies (n.er1 of the Article 29) they can "only accomplish environmental impact studies in Angola the specialists and medium technicians or superiors that are registered .."(ner 3 of the Article 29).

The consultants' registry and done by application, containing the following data (Article 30):

- a) "name, nationality, profession, work-place, habitual residence and number of taxpayer";

- b) a "certificate of academic and professional" qualifications;
- c) a demonstrative "summary of the experiences in the activities of environmental consultancy and knowledge of the reality and of the problems of the environment in Angola." The individual consultant should present a declaration proof that is not an employee or contracted of the responsible organism for policies of the environment (n^{er}2 of the Article 30).

In the case of partnership, it should join (n^{er}3 of the Article 30):

- a) information relative to consultants, in the terms of the previous numbers";
- b) "a compilation of studies already accomplished";
- c) "certificate of the commercial registry and number of taxpayer's registry."

Relatively to the consultancy exercise for foreigners, "the consultancy societies or foreign consortia... they are obligated to associate Angolan consultants or societies of consultancy of Angolan law" (Article 31).

(b) ANOTHER IMPORTANT SPECIFIC DIPLOMAS

These diplomas are the following, by chronological order:

- Regulations for Soil, Flora and Fauna Protection (Decree n.^{er} 40 040, 1st Series, dated 9th January 1955)
- Law for the Sanitary Regulation (Law n.^{er} 5/87, dated 23rd February)
- Law for Geological and Mining Activities (Law n.^{er} 81/92, dated 17th January)
- Diploma concerning Environmental Protection during Oil Activities (Decree–Law n.^{er} 39/2000, dated 10th October)
- Law for the Aquatic Biological Resources (Law n.^{er} 6–A/2004, dated 8th October)
- Law for Oil Activities (Law n.^{er} 10/2004, dated 12th November)
- Law of the Associations for Environmental Protection (Law n.^{er} 3/2006, dated 18th January)
- National Strategy and Action Plan for Biodiversity (Resolution n.^{er} 42/2006, dated 26th July).

These diplomas – which are summarised below – concern the main specific fields in what relates to environment, having been decided to refer exclusively the most relevant ones for each field.

REGULATIONS FOR PROTECTION OF SOIL, FLORA AND FAUNA (Decree n.^{er} 40 040, dated 9th January 1955)

This diploma, dated from the colonial period, contemplates soil, fauna and flora in an integrated way and intends to reflect, in the legal context, the unity of these three environmental components of nature protection and the convenience of having one single entity to manage them.

Among other relevant specifications, it regulates the protection of flora and vegetal species – including forest areas – forbids hunting during certain periods or in some risk areas or for some animals and classifies and defines the regime applicable to zones for protection of flora and fauna (national parks, several types of reserves and areas protected from hunting).

LAW OF THE SANITARY REGULATIONS (Law n.^{er} 5/87, dated 23rd February)

Its purpose is to supervise the application of public health measures integrated into the general public health activities, intending to promote the health of the populations and the environmental sanitation (mainly in what relates to urban communities, public places and dwellings).

LAW FOR GEOLOGICAL AND MINING ACTIVITIES (Law n.^{er} 1/92, dated 17th January)

This Law intends to promote conditions to insert the development of mining industry into national context, leaving to the State the role of licensing all geological activities and control of their development.

The entities licensed for research or exploitation, as well as any of their associate firms or subcontracted firms, must protect nature and the environment, the objective liability of the polluter being foreseen.

DIPLOMA FOR ENVIRONMENTAL PROTECTION DURING OIL INDUSTRY ACTIVITIES (Decree-Law n.^{er} 39/2000, dated 10th October)

This diploma intends to protect the multiple valences of the environment – human health, water, soil and sub-soil, air, flora and fauna, ecosystems, landscape, atmosphere and cultural, archaeological and aesthetical assets – during oil industry activities, both in land and in sea. Those activities include research, evaluation, development, production, transport, refining, processing, storage, distribution and selling oil and its derivatives, as well as the use and storage of chemical products needed by the oil industry activity (Article 1 – a)).

The company that holds the concession and their associates, through the operator and other oil companies, must take all required precautions to prevent the negative effects of pollution and limit its consequences as much as possible in case those effects take place (Article 4 –1).

They must also prepare an Environmental Impact Assessment for new facilities or for modifications of existing facilities, that may endanger significantly the environment according to the Ministry for Oils (Article 6); that assessment will be submitted to the Ministry for Oils, which will ask previous advice to the Ministry of Fisheries and Environment before its approval (Article 6 – 4).

The company that holds the concession and their associates must also prepare and submit to the approval of the Ministry for Oils and keep duly updated the following documents: plan for spill prevention (Article 7 – 1), plan for response to spill (Article 8 – 1), plan for management, removal and storage of wastes (Article 9 – 1) and management plan for operational discharges (Article 10 – 1). The above entities must also prepare and implement a plan for inactivate and restore the facilities site (Article 11– 1).

In what relates to eventual spills of great significance that may endanger the environment, the same entities must:

- Prepare a National Plan for emergency response, jointly with the Ministry for Oils, who must coordinate response to those events in agreement with the Ministry for Fisheries and Environment (Article 14 – 1);
- In case a spill occurs: (a) communicate to the Ministry for Oil any spills for which they are to be blamed or that result in damages to the environment (Article 15 – 1); (b) cooperate in the control, fight and cleaning of those spills (Article 16 – 1); (c) pay costs and expenses to other oil companies that may have cooperated for that purpose (Article 16 – 4).

It must be emphasized that the company holding the concession, their associate firms and other oil companies, must repair damages and/or compensate the State for the damages they account for during their activities, whether they are guilty or not guilty (Article 21 – 1).

LAW OF AQUATIC BIOLOGICAL RESOURCES (Law n.º 6–A/2004, dated 8th October)

The purpose of this Law is to establish the rules for ensuring sustainable conservation and use of aquatic biological resources existing in water under jurisdiction of Angolan State, as well as the fundamental basis for exercising activities related to them, mainly fishing and aquaculture (Article 3).

This Law enhances the purpose of promoting the protection of the aquatic environment and of coastal and riverine areas, as well as the research about biological resources, their ecosystems and the environmental factors that condition their equilibrium (Article 3) and applies not only to aquatic biological resources but also to activities related to them that take place on land or at inland, estuarine or marine waters (Article 4).

This diploma contemplates, in detail: fishing management; protection measures for aquatic resources and environment; boats and plants for processing, manufacture, distribution and aquaculture; entities and services to control the resources under consideration; and obligations.

In what relates specifically to the management of aquatic biological resources, some aspects must be enhanced:

- The essential purpose of measures concerning water pollution is to preserve the resources and the aquatic ecosystems and to prevent or reduce as much as possible the emission and accumulation of toxic, hazardous and/or harmful substances in water;
- In any kind of activity to be developed through the use of those resources, it must be ensured, even before its execution, the least environmental impact over those resources, through the submission of an environmental management plan including measures to avoid or minimise those negative impacts.

LAW OF OIL INDUSTRY ACTIVITIES (Law n.^{er} 10/2004, dated 12th November)

This Law intends to define the rules for the access to and exercise of the oil industrial activities in the areas available at the surface or submerged of the Angolan territory, in the inland waters of the territorial sea, in the exclusive economical zone and in the continental platform.

This diploma revoked Law n.^{er} 13/78 dated 26th August, which was the main diploma about this issue, maintaining the fundamental principle of the State property of the oil resources specified by the former law, as well as the regime of an exclusive concessionaire company and the obligation of companies to associate for oil concessions. Besides, it obliges the companies that hold the concession to take all precautions in what relates to environmental protection, namely in relation to health, water, soil and subsoil, air, preservation of biodiversity, flora and fauna, ecosystems, atmosphere and cultural, archaeological and aesthetical assets.

LAW OF THE ASSOCIATIONS FOR ENVIRONMENTAL PROTECTION (Law n.º 3/2006, dated 18th January)

These associations – which may be of municipal, provincial or national, according to the number of their members (Article 3) – after subscribe a deposit at the Ministry for Justice must register at the public service entitled to environmental policy and are obliged to send every year to that entity their programme and activity report, their accounts duly approved by the competent authority and the number of their members at 31st December of the respective year (Article 4).

The Associations for Protection of the Environment may participate and take action in the definition of the environmental policy and in the great lines of action in that matter and participate in the advisory services of the Public Administration with competences related to environment, nature conservation, natural heritage and management of the territory (Article 5); besides they may consult and be informed about evaluation studies for environmental impact assessment following legal rules (Article 6).

By another side, they must cooperate with central and local administration in the respective area in the preparation and execution of plans and actions concerning environmental protection and valorisation of nature and environment and must assist, formally and non-formally, Governmental services entitled to environmental policy and education in the preparation and execution of study programmes and environmental education programmes (Article 9).

NATIONAL STRATEGY AND PLAN OF ACTION FOR BIODIVERSITY (Resolution n.º 42/2006, dated 26th July)

Through this resolution the Angolan Government approved the National Strategy and Plan of Action for Biodiversity, so fulfilling the requirement of the Convention for Biodiversity. Its global objective is to incorporate into the policies and programmes for development measures to conservation and sustainable use of biodiversity and fair and equal distribution of the biological resources to benefit the whole people of Angola.

This strategy intends to execute actions during a ten years period and so priorities must be defined and opportunities must be maximized according to the degree of implementation of the activities inserted in the Strategy.

In order to set priorities to its activities, the Strategy is divided into eight strategic areas: research and information, education for sustainable development, biodiversity management

in areas of environmental protection, sustainable use of biodiversity components, role of the communities in biodiversity management, institutional reinforcement, legislation and its implementation and, at last, coordination and monitoring.

The Ministry for Urbanism and Environment created a Unit for Management and Coordination of the National Strategy and Plan of Action for Biodiversity, in order to promote the implementation of those strategic areas.

Like the institutional units for environmental management, Angolan legislation concerning environment is very young and so, notwithstanding having been published several important legal diplomas related to principles and fundamental general policies it is necessary to intensify the field application of those policies and give special attention to specific regulations.

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ANNEX

EMRP Subprojects Activities
by Sub-component and by Time Period

SUB-COMPONENT A2 – HEALTH

OBJECTIVE	ACTIVITY	REF. PP	REF. CONTRACT	Year 2006	2007												2008												2009							
					Jan.	Fev.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Fev.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Fev.	Mar.	Apr.	May	Jun.	Jul.	Aug.
Objective 4: Reinforce the institutions in the sector of health																																				
Studies																																				
	Preparation of bidding documents for textbooks, teacher guides and other didactic material																																			
	Engineering studies to design and prepare tender documents for hospitals and health centers construction																																			



SUB-COMPONENT A3 – EDUCATION

OBJECTIVE	ACTIVITY	REF. PP	REF. CONTRACT	Year 2006	2007												2008												2009					
					Jan.	Fev.	Mar.	Apr.	May	Jun.	Jul.	Aug	Sept.	Oct.	Nov.	Dec.	Jan.	Fev.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Fev.	Mar.	Apr.	May	Jun.
Objective 2: Prepare Project's education component Phase 2																																		
3.1. Studies																																		
	Preparation of bidding documents for textbooks, teacher guides and other didactic material																																	
	Engineering studies to design and prepare tender documents for primary school construction	1E.C1																																

SUB-COMPONENT B1 – WATER

OBJECTIVE	ACTIVITY	REF. PP	REF. CONTRACT	Year 2006	2007												2008												2009					
					Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Fev.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Fev.	Mar.	Apr.	May	Jun.
Objective 1: Provide water in Kuito																																		
	Project design																																	
	Works supervision and control	1W.C2	PC/002/AGUA/2005																															
	Works execution	1W.W3	PO/003/AGUA/2006																															
	Assistance for management and maintenance		PO/003/AGUA/2006																															
Objective 2: Rehabilitate and extend the water distribution network in the city of Malanje																																		
	Project design																																	
	Works supervision and control	1W.C1	PC/001/AGUA/2005																															
	Works execution	1W.W1	PO/001/AGUA/2005																															
	Assistance for management and maintenance		PO/001/AGUA/2005																															
Objective 3: Reinforcement of the water providing system in the city of N'Dalatando																																		
	Project design																																	
	Works supervision and control	1W.C2	PC/002/AGUA/2005																															
	Works execution (lot 1)	1W.W2	PO/002/AGUA/2005																															
	Assistance for management and maintenance		PO/002/AGUA/2005																															

SUB-COMPONENT B2 – ENERGY

OBJECTIVE	ACTIVITY	REF. PP	REF. CONTRACT	Year 2006	2007												2008												2009					
					Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Fev.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Fev.	Mar.	Apr.	May	Jun.
Objective 1: Medium and low-voltage electricity distribution systems for Malanje, Uíge, Kuito, Luena e N'Dalatando																																		
	Engineering studies to design and prepare tender documents for medium and low-voltage distribution systems	1P.C1	PC/001/ENERG/2006																															
Objective 2: Medium and low-voltage electricity distribution systems for Luanda																																		
	Engineering studies to design and prepare tender documents for medium and low-voltage distribution systems	1P.C2	PC/002/ENERG/2006																															

