REPORT

New International Airport of Cabinda (NAIC Project) - Angola

ESIA_Non-Technical Summary

Submitted to:

ASGC
Level 3, Building 7, Bay Square, Business Bay
Dubai, United Arab Emirates

Submitted by:

WSP ITALIA S.r.l.
Via Antonio Banfo 43, 10155 Torino, Italia

+39 011 23 44 211

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Prepared by

Giovanni De Franchi – Project Director

Barbara Scorza – Project Manager, EHS component lead

Acciaro Maria Diletta – Environmental, Health & Safety specialist

Francesca Rossi – Social specialist

Silvia la Gala – Biodiversity specialist

List of Acronyms

AoI	Area of Influence
CAs	OECD Common Approaches
CCRA	Climate Change Risk Assessment
CH	Critical Habitat
DAR	Dar Angola Consultoria Limitada
ENNA	Empresa Nacional de Navegaçao Aerea
EPIV	Equator Principles IV
ESIA	Environmental Social Impact Assessment
GHG	Green House Gases
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFC	International Finance Corporation
ILO	International Labour Organization
IUCN	International Union for Conservation of Nature
km	Kilometers
MoT	Ministry of Transportation
NAIC	New International Airport of Cabinda
NTS	Non-Technical Summary
OEC	Odebrecht Engineering & Construction
SGA	Sociedade Gestora de Aeroportos
UKEF	UK Export Finance
UN	United Nations
UNDP	United Nations Development Programme

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FIGURES

1.0 INTRODUCTION

This document is the Non-Technical Summary (NTS) of the Environmental and Social Impact Assessment (ESIA) report prepared for the construction and development of the New International Airport of Cabinda (NAIC or the Project), located in the Province of Cabinda, Angola.

1.1 Background

The Province of Cabinda is separated from the rest of Angola by a narrow strip of territory belonging to the Democratic Republic of the Congo, bounding the province to the south and the east. To the north there is the Republic of the Congo and to the west the Atlantic Ocean. Air transportation is the main mode of transport that connects the Province of Cabinda with the mainland in Angola. The capital city of the province, Cabinda currently has a single small airport. This existing airport offers national flights and serves as the main gateway into the province (daily flights connect the city of Cabinda with Luanda, the Angola capital). Given the expected growth in air traffic demand, and for providing more connections, there is an immediate need to increase the existing airport passenger and aircraft movement handling capacity. Due to the existing airport location (i.e., a highly urbanized area), several constraints prevented its expansion.

Figure 1: NAIC location and existing airport location.

Therefore a solution based on an alternative and suitable area within the province of Cabinda to build a new airport (i.e. NAIC) has been identified.

The Project Proponent, the Ministry of Transports of Angola, conducted a comparative analysis among different locations before selecting the final area as it is shown in Figure 2 below.

Figure 2: New International Airport of Cabinda - Project Location Options.

The choice of location was based on the evaluation of the following key criteria:

- Proximity to the city of Cabinda;
- Physical constraints of the Site;
- Compatibility with the Cabinda and Municipal Master Plan;
- Local physical features (i.e., Seismicity, Topography, Geology and Hydrogeology);
- Airspace constraints;
- Connectivity;
- Runway Orientation; and
- Availability of construction material.

The location named as Option 3 in Figure 2 satisfied all the criteria used in the evaluation and was therefore selected as the most suitable location for the placement of the new airport.

1.2 Roles and responsibilities

The Ministry of Transports of Angola engaged Dar Angola Consultoria Limitada (DAR, in Figure 3) for preparing the design study of NAIC and selected Odebrecht Engineering & Construction (OEC, in Figure 3), a Brazilian private company specialized in the heavy civil construction, for the construction activities. The Dubai-based international construction company, ASGC (rebranded as INNOVO Group during the course of the study), operates for securing the financing process and acts as management contractor (as shown in Figure 3).

The Project started with the process of seeking finance from the *UK Export Finance* acting as the Export Credit Agency and *Standard Chartered Bank* acting as the Agent. The loan facility, to be provided through the Ministry of Finance, is aimed at undertaking the design and the construction costs.

The Lenders involvement implies several Environmental and Social obligations including the development of an Environmental and Social Impact Assessment process carried out in accordance with national regulation and international requirements. WSP Italia (WSP) - with the support of the Angolan firm SAIOZ Engenharia Ambiental (SAIOZ) acting as local partner – was responsible for the development of the ESIA related studies.

Once construction is completed, the airport will be operated by the Sociedade Gestora de Aeroportos (SGA, in Figure 3), owned by the Ministry of Transports of Angola and currently responsible for the management of all the Angolan airports.

Air traffic management including air navigation systems and infrastructure will be under the responsibility and control of the Empresa Nacional de Navegação Aérea (ENNA, in Figure 3), a public company indirectly administered by the Angolan state, and supervised by the Ministry of Transport, and responsible for the development, installation, management and operation of air navigation services, systems and infrastructure. The company TRIEDE operates as works supervisor.

A summary of all key parties involved is represented in the following picture (Figure 3).

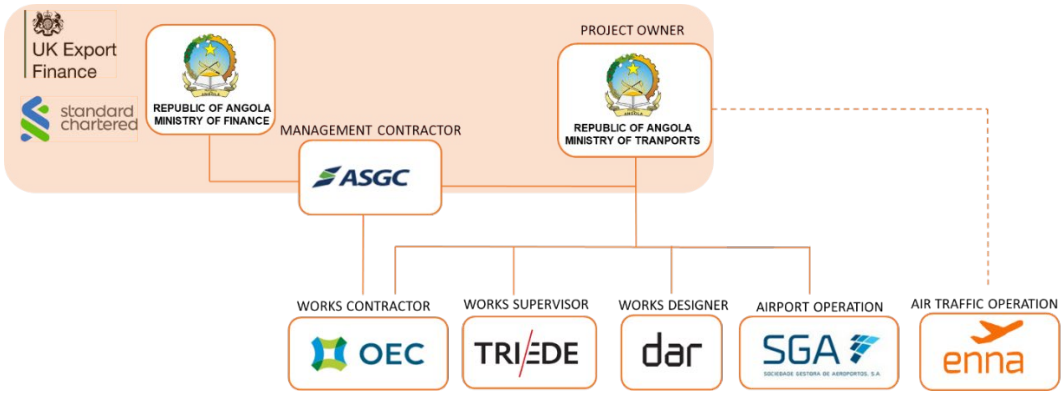


Figure 3: Key parties organization chart.

2.0 PROJECT DESCRIPTION

As previously anticipated, the Province of Cabinda is physically separated from the rest of Angola by a narrow strip of territory belonging to the Democratic Republic of the Congo, and its connection to the others Angolan regions is guaranteed predominantly by air. Except for the capital, Cabinda City, the whole province is one of the most under-developed regions of Angola, with a large portion of population living in poor quality housing without essential social facilities, infrastructure and services.

For building NAIC, the Ministry of Transports of Angola, identified a plot of land located 36 km northwards from the city of Cabinda. The selected site for the construction of NAIC consists of an unoccupied greenfield, free from settlements, airspace constraints and obstacles to air navigation, wide about 7 km in width and 2.5 km in length. The remoteness of its location has placed a severe constraint on its development.

The NAIC design was prepared to be compliant with the ICAO – *International Civil Aviation Organization standards and recommended practices* for providing optimum level of service as per the IATA – *International Air Transport Association guidelines and modern practices and boost aviation safety and security*.

2.1 Project construction

The Contractor OEC is in charge of the construction, dealing with the supplies, installing the equipment and fitting out NAIC.

Construction activities are planned to take place within 48 months, divided into the following 5 main stages (plus other essential activities such as roads and parking lot construction and logistical support for demining the area destined for the construction):

- STAGE A - activities performed on the runway side (i.e., earthworks. installation of aeronautical pavements, drainage activities, signaling implementation and generation and supply of electrical energy);
- STAGE B - activities performed on the ground side (i.e., construction of access roads, installation of electrical and hydraulic infrastructures, landscaping and installation of urban furniture);
- STAGE C - construction activities (i.e., earthworks, architectural and structural activities);
- STAGE D - systems and equipment implementation (e.g., security, communication, control tower); and
- STAGE E - access works (e.g., pipelines, lighting, access roads).

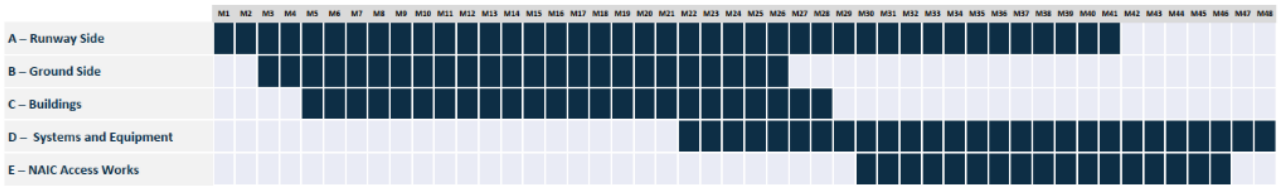


Figure 4: Construction Work Schedule.

At the time of the ESIA development, OEC already started building the construction camp within the Project footprint. The Project foresees the construction of various onsite funded facilities. Regarding the Project associated facilities (i.e., facilities that are not funded as part of the Project and that would not have been constructed or expanded if the Project did not exist and without the Project the facility would not be viable), an overhead power line will be built for supplying energy to NAIC. This power line, about 2 km long, will be constructed - under the responsibility of the Ministry of Electricity - from Malembo Thermal Power Station to the Project site and will be included within the Area of Influence.

2.2 Project operation

The existing airport will be dismissed once NAIC will be completed; however, to date, no information is available about its decommissioning. The existing airport workforce will be transferred to NAIC. SGA will be responsible for the NAIC operation once the construction activities will be completed. The main activities to be carried out by the SGA consist of:

- Management and development of airport infrastructure;
- Provision of services aimed at ensuring the departure and arrival of aircrafts;
- Boarding, disembarking, and forwarding of passengers and baggage; and
- Management of cargo and mail, as well as at other airport infrastructure.

NAIC development foresees the following two implementation phases:

- **Initial Phase**, which will encompass the demand for the next 15 years, until 2036. In this phase, the runway will not have a full length of parallel taxiway and therefore a turning area will be required to facilitate a 180 degree turn of the planes. A turning area is proposed at each end of the runway to be used during take-off and landing operations in case an aircraft needs the full length of the runway. Passenger service and baggage areas design will consider 700 persons/peak-time (i.e., 350 in departures and 350 in arrivals) for

domestic passengers plus 500 persons/peak-time (i.e., 250 in departures and 250 in arrivals) for international passengers.

- **Final Phase**, which will enable further airport expansion beyond the initial 15-year period (after 2036), possibly into 2050 and beyond, with opportunities to double peak-time throughput. In this phase a complete parallel taxiway is planned to be provided along the entire length of the runway, in order to accommodate, without significant delays, the demands of aircraft arrivals and departures on the runway system. The expected combined peak hour demands for arrivals and departures is of about 1700 passengers, specifically, passenger service and baggage areas design will consider 1000 persons/peak-time (i.e., 500 for departures and 500 for arrivals) for domestic passengers plus 700 persons/peak-time (i.e., 350 for departures and 350 for arrivals) for international passengers.

Annual passenger demand is spread over 333 days (number based on general practice which assumes that aircrafts operate regularly 90% of the days).

An illustrative picture of the main NAIC facilities is provided in Figure 5.

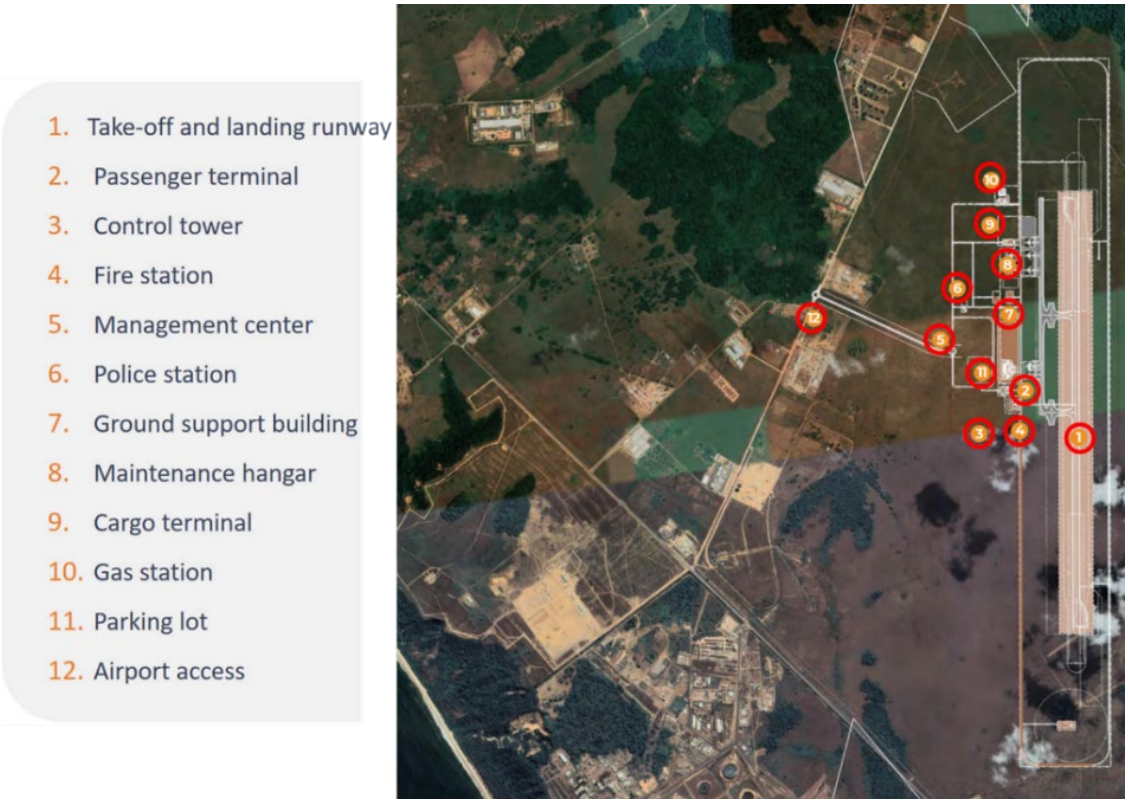


Figure 5: NAIC main structures.

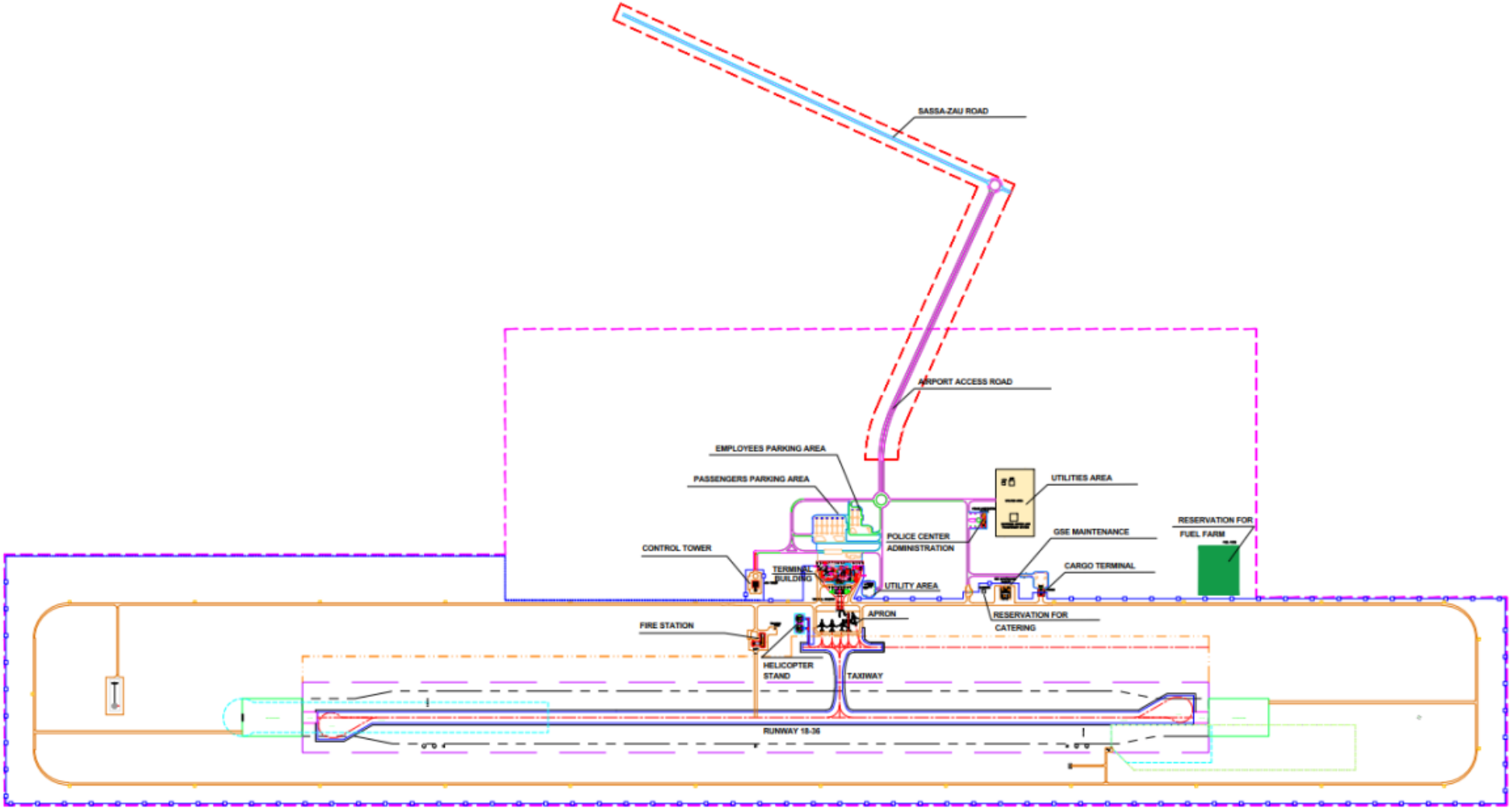


Figure 6: NAIC general plan.

3.0 LEGAL ASPECTS AND COMPLIANCE

The present study was prepared in accordance with the Equator Principles IV and the OECD Common Approaches which require the Project to be compliant with the IFC Performance Standards. Also, the following were considered:

- A number of international substantive environmental Laws, standards and regulations including conventions and treaties adopted by Angola;
- Requirements of other Lenders, such as International Labour Organization ILO conventions covering core labour standards and the basic terms and conditions of employment; and
- Applicable local, national, and international environmental and social (including occupational health and safety) legislation and guidelines, including key environmental and social permits and approvals required under national legislation.

The assessment of the impacts on the physical, the biological and the social components has considered the most stringent requirements[1] applicable to the Project compared among the international and national standards. The ESIA report presents a review of the applicable requirements and identifies and adopt the most stringent in order to ensure an appropriate level of environmental protection and of workers and community health and safety.

4.0 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

The applicable standards require that Project proponents identify and manage environmental and social risks and impacts within the Project “Area of Influence” (AoI), defined as the area likely affected by the Project and the client’s activities and facilities that are directly owned, operated or managed (including contractors) or that are a component of the project. For NAIC this has been identified from a minimum buffer zone of 1 kilometer for the environmental component, 2 kilometers for the social components and some taxa of the biodiversity parts, up to a broader area of 50 kilometers for the study of presence of birds and big mammals (see Figure 7 and Figure 8).

During the ESIA process, by using appropriate methodologies, WSP and SAIOZ collected both field data (during appropriate seasonal campaigns in the wet and dry seasons) and secondary information (e.g., publicly available data) to acquire knowledge on the baseline conditions at regional and local level for the physical, biodiversity and social components. The baseline conditions and a summary of the data collected is detailed in the following sections.

[1] The client will refer to the EHS Guidelines or other internationally recognized sources, as appropriate, when evaluating and selecting resource efficiency and pollution prevention and control techniques for the project. The EHS Guidelines contain the performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from the levels and measures presented in the EHS Guidelines, clients will be required to achieve whichever is more stringent. (IFC Performance Standard 3).

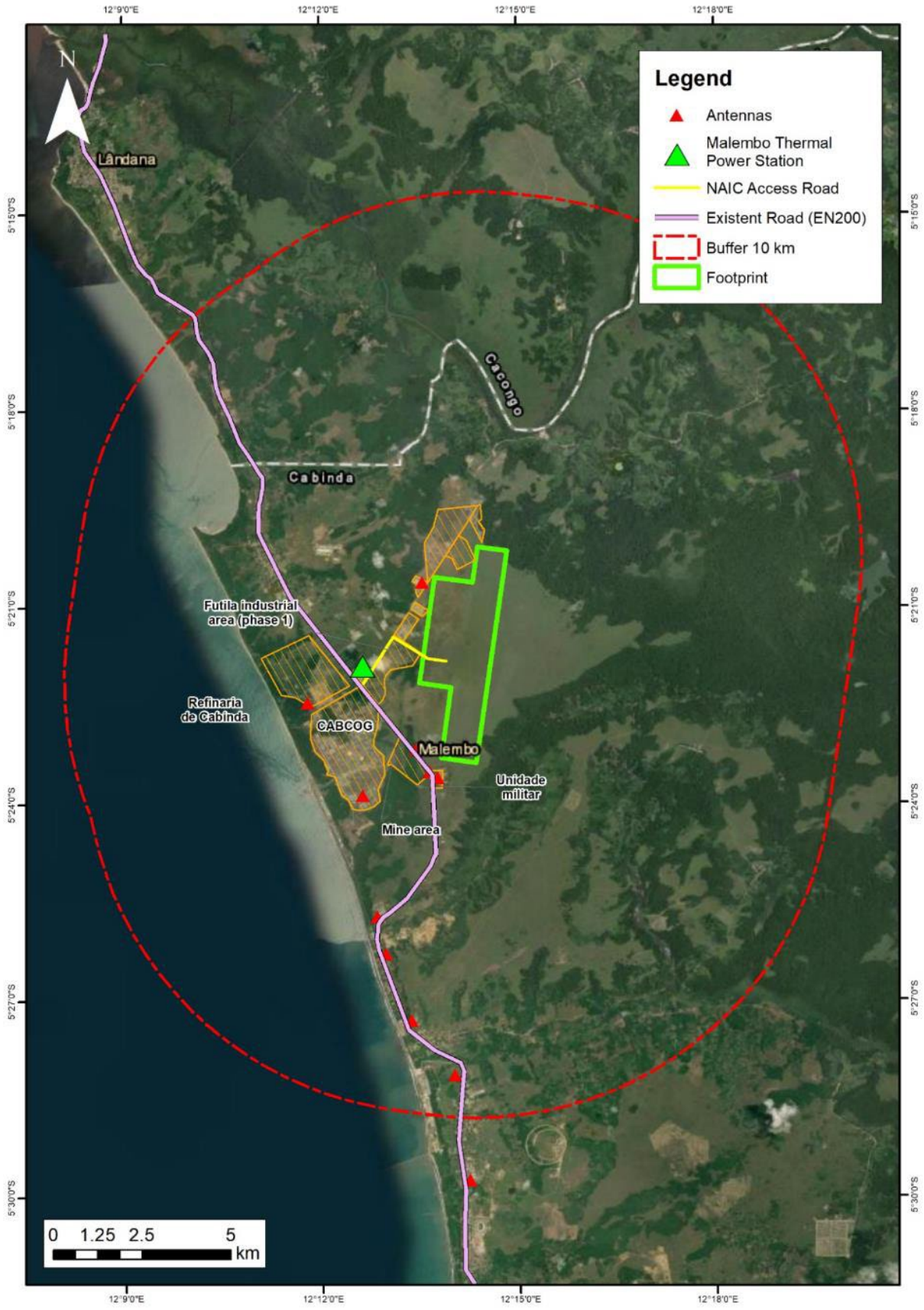


Figure 7: Project footprint within the 10 km buffer, and other features present within the AoI.

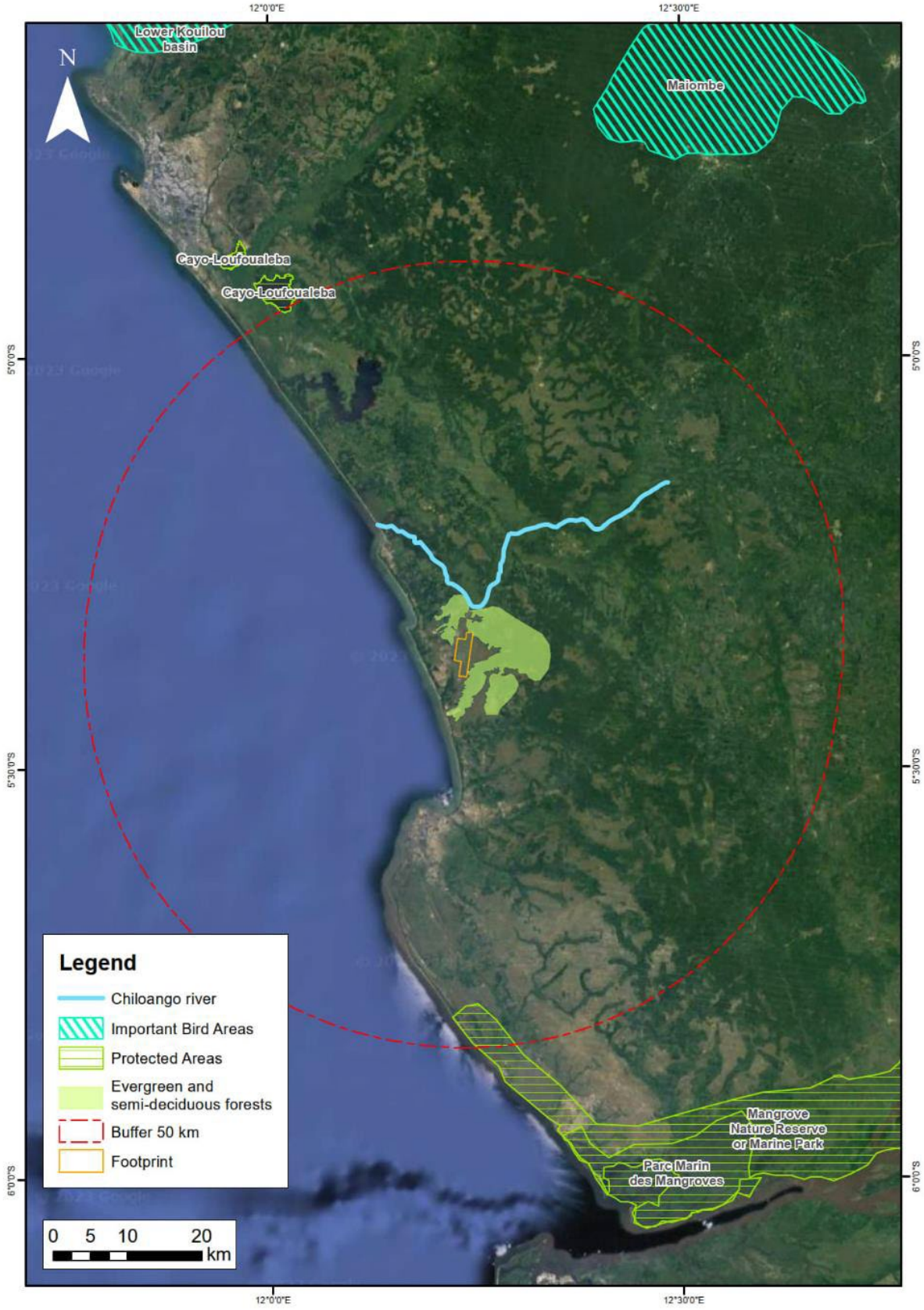


Figure 8: Biodiversity aspects within the 50 km buffer area of influence.

4.1 Baseline conditions – Physical Environment

Geology and Seismicity

In Cabinda coexist various types of Archean to Quaternary deposits, mainly consisting of sands, siltstones, clays, limestones, granites, shales, rhyolites, quartzites and schists. The most recent deposits (i.e., Quaternary) are located on the coastal area, to the West of Cabinda province, while the most ancient rocks (i.e., Archean) outcrop to the Eastern portion of Cabinda. Specifically, at local level, the Project site is underlain by alluvial sand, silt, coarse gravel, clay and laterite Neogene – Quaternary deposits. Cabinda is reach in mineral resources. Close to the Project site three possible mining locations for extracting quartz, feldspar, kaolin and kyanite (none is currently in operation) have been identified. Regarding the local tectonic conditions, Angola is located on a tectonically stable zone. Cabinda seismic risk is classified as very low according to currently available information; specifically, there is less than 2% of a chance that a potentially damaging earthquake will occur in the Project area in the next 50 years. No active faults are reported across the Project site.

Geomorphology and Topography

Cabinda lays on a platform (at about 100 to 200 m above the sea level) evolving in a slightly hilly plain (at about 400 m above the sea level) where the mountain region near Buco-Zau begin. The Project site lays on a flat area, at about 140 m above the sea level. Heading East, the landscape slopes toward the Chiloango River Valley and the forested area.

Climatology

The climatic characterization of the Project area is fundamental because of its physical impact on the natural resources and its influence on potential issues like dispersion of atmospheric pollutants and propagation of acoustic emissions. The Project site lays on a tropical humid climatic zone, classified as a tropical savanna climate, with particularly dry winters. The temperature ranges from 25-27 °C in July/August to 30-32 °C in February to April. The dry period goes from May to September and the wet period from October to April. The local predominant wind comes from South and Southwest.

Soil and Land Use

The soils in the Project area are of ferralsol type. Ferralsols are porous, red to yellow coloured, very acidic soils rich of metals. Saioz conducted a soil monitoring campaign in the Project area in March 2023. The campaign consisted of collecting and analysing soil samples. Angola lacks national standards for soil, so the Dutch Pollutants Standards and the Italian Legislative Decree 152/2006 were used. All the values were below the contamination threshold, therefore no soil contamination was identified at the Project site.

Hydrology and Surface Water

The Project site is located 4 km South of the Chiloango River, the largest basin of the entire hydrographic context. A survey with collection of water samples was carried out in October 2023. The laboratory analysis of surface water pointed out an organic and nutrient contamination and a considerable concentration of coliforms (i.e., Chemical Oxygen Demand COD, Ammoniacal nitrogen, Phosphates, and total and faecal Coliforms). The existence of coliform bacteria in aquatic environments indicates a contamination from faecal material which could also explain the high values of organic and nutrient contamination. There are several small to medium rural villages located along the course of the Chiloango River (i.e., inflow of wastewater/domestic sewage into the river). In addition, Chiloango River runs along dense forested areas, which can contribute to significant organic matter inputs. The extensive agricultural areas located along the Chiolango River, nearby Congo boundary, could also explain the nutrient contamination. Regarding the heavy metals content, high levels of Chromium were measured. Such values may be linked to anthropogenic activities (i.e., introduced with the

inflow of wastewater/domestic sewage into the river). NAIC will be served by both Cabinda water supply network supplied by surface water intake pumping station from the Chiloango River and by the onsite water well.

Hydrogeology and Groundwater

There are no publicly available data on the local aquifer conditions and characteristics. On the Project area has been installed a water well aimed at supplying water for construction purposes. The water well borehole reached a depth of 192 m and has been equipped with a submersible pump to extract the water (pushed to a depth of 140 meters below the local ground level). According to the hydrogeological data collected, the aquifer flows at about 96 m below the local ground level; the area is underlain by alluvial sand, silt and coarse gravels Pliocene-Quaternary deposits. Above the groundwater level, the hydrogeological survey revealed the existence of clay layers, which generally act as barriers and protect the aquifer from the infiltration of potential contaminants. Following the water well drilling, in December 2023 Saioz specialists collected a groundwater sample for laboratory analysis. The analysis highlighted presence of Manganese, Nickel, Bario and Phosphates. As for the case of surface water, the extensive agricultural areas located along the Chiolango River, nearby Congo boundary, could explain the Phosphates. The Manganese and the Barium, instead, might be of natural origin (mostly due to the local lithology). The Nickel might be due to release from ducts or other metal structures (as the water well drilling metal core). Given the existence of pollutant elements in both the surface water and the groundwater, the water treatment station dimensioning will take into account the detected pollutants.

Air Quality

The main sources of air pollutants identified within the Project area are the exhaust emissions due to road traffic, the conveyed and diffuse emission of the major industrial facilities (e.g., Malongo Base and all associated units related to the gas and oil sector and Caio Port) and the dust and particulate emissions from the traffic and the wind blowing on loose soil areas and sandy roads. The sources of air pollutants expected from NAIC operation are the engines and support equipment (e.g., emergency generators) generating exhaust emissions and the dust and particulate emissions from the increase of road traffic. Considering that in Cabinda the winds are predominantly from the south, the air pollution will mostly affect receptors located to the north, especially the communities of Malongo, Bissassanha and Sassa Zau. The forested areas around were also considered as potential sensitive receptors.

For the local baseline air quality conditions, Saioz conducted two air quality monitoring campaigns, one in March 2023 and one in October/November 2023. Angola lacks national standards for air quality, therefore analytical results were compared with the *World Health Organization WHO 2021 global air quality guidelines: Particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide.*

The first monitoring campaign highlighted high levels of Particulate Matter ($PM_{2.5}$ and PM_{10}), Ozone (O_3), Sulphur Dioxide (SO_2) and Nitrogen Dioxide (NO_2). These types of pollutants might be possibly associated with all the heavy industry around the Malombo oil base and the road traffic. The campaign results also pointed out the presence of some heavy metals in the sampled particulate (i.e., Arsenic and Cadmium, showing exceedances of the threshold values, and Chromium, Copper and Manganese, for which no Project standard was proposed). The major source of heavy metal's emission identified onsite is the topsoil, specifically, the dust and particulate matter generated from the loose soils and issued into the atmosphere (i.e., local lithologies containing traces of heavy metals, as also evident from the water and soil analyses results). This is mainly due to heavy traffic on the unpaved/dirt roads in the Project's surroundings.

The results obtained in the second monitoring campaign showed average values of $PM_{2.5}$ and PM_{10} above the considered Project's Standards and quite low gaseous pollutants concentrations (likely due to the weather characteristics, different from the first campaign), except for O_3. The exceedances of such pollutants likely

depend on air emissions of local industries and refineries, road traffic and wind on unpaved roads/bare soil, and bushfires often started for clearing the vegetation.

Noise and Vibrations

In March 2023, a noise and vibrations monitoring campaign was conducted to assess the conditions related to the construction phase. The study covered the extended area of influence of the aircrafts take-off and landing. The results show that the region is already affected by some noise disturbance. The main sources of noise in the Project's area of influence are located in Malongo oilfield and along the road that connects the EN100 to the East.

The study identified several sensitive receptors: the closest areas with residential and scholastic use, the health services, the dormitory area of the Malembo Development Centre and the communities of Bissassanha and Sassa Zau to the North, and Futila to the South. These areas are aligned with the aircraft approach path of the airport and are likely to receive noise emissions from air traffic.

The study also considered the communities of Malembo to the West and Chiela to the East as sensitive receptors. However, they are more than 5 kilometres away from the aircraft approach path of the airport and are, therefore, not likely to receive any noise emissions from air traffic. Malembo, on the other hand, could be influenced by road traffic originating in NAIC and going northwards on the EN100 road.

The distance of the sensitive receptors from the runway was calculated between 6.8 km and 1.5 km. As part of the study, a Noise Model relating to the Project operation phase was developed. The surrounding areas of the Project primarily comprise modern industrial developments made of reinforced concrete and steel structures that are not sensitive to vibrations. However, in the residential areas older and poor quality buildings among newly constructed concrete and brick buildings could be more susceptible to vibrational impacts.

Waste Management

- Solid waste management

According to the publicly available records, about 75% of the waste generated in Angola is sent to landfills and dumpsites. There are no relevant waste collection systems or plants in the Province of Cabinda. The solid waste generated within the province is delivered to licensed waste operators and sent to valorisation/recycling plants in Luanda or other countries. The Province of Cabinda is served only by municipal landfills. The major municipal landfill in operation is Yema, located to the south of the city of Cabinda, about 60 km from the Project site. Initially, Yema was designated (by Cabinda Municipal Administration) for the disposal of the solid waste generated during NAIC construction phase. However, the conditions of the landfill do not meet Project standards, therefore it will not be considered (i.e., the site is improperly managed, there is no fence, housekeeping is poor, and the waste cells are not lined, and no leachate control system is installed). The Government of Cabinda selected an area for implementing a new landfill and waste collection and treatment centre, for waste separation and preparation for recycling and recovery, including an incinerator for hospital waste. Reportedly, the new landfill will be built in the Subantando Village, approximately 47 km far from NAIC. The Government already selected the Contractor for starting the construction but there is no scheduled date for the start of works. MoT confirmed that the new landfill will be ready in the next 3 years, available for the NAIC operation phase. Reportedly, for the construction phase, OEC will build an onsite landfill for non-hazardous waste for organic and general waste disposal; the recyclable waste (e.g., plastic, wooden, metal and paper waste) will be sent to the recycling and recovery companies while the hazardous waste will be transferred to Luanda. Once the operation phase will start the new Cabinda landfill should be operational.

- Wastewater management

There is no wastewater collection system in the Province of Cabinda. Most of the industries developed private plants for collecting and treating the wastewater generated onsite. The main commercial activities and the small-scale industrial facilities also rely on private wastewater treatment systems, mainly septic tanks. At community level, there is no public collection system, sewage system or sanitation network. Most houses do not own septic tanks. The most common facilities adopted in the local communities are the latrines (i.e., about 3 meters deep excavation holes for managing the households' physiological needs). During construction, the wastewater will be treated through an onsite Wastewater Treatment Plant and reused as much as possible, and the sanitary wastewater will convey into septic tanks. The resulting sludge will be collected by licensed operators and disposed of. For the operation phase a Wastewater Treatment Plant will collect both civil/domestic wastewater and operations wastewater (e.g., equipment and machinery repairing, washing and cleaning, from airplane hangars or other maintenance facilities which may contain oil or heavy metals). The treated effluents will be used onsite for irrigation, while the sludge will be disposed of.

Energy Sources

Angola has a variety of in-country energy resources such as oil and gas reserves, high-potential rivers, forests and vast greenfield and unexplored territories with great solar potential. Angola currently uses three electricity production systems: hydro, thermal and renewables. At the local level, Cabinda has six power plants (of which 4 are of thermal type and 2 are of hybrid type), with a combined installed capacity of 145 Megawatt. The Project energy will be supplied by the existing public network from the Malembo Thermal Power Station, having a capacity of 95 Megawatt, located about 1.5 km from the Project site. For this purpose, an overhead power transmission line will be constructed from Malembo Thermal Power Station to the Project site.

4.2 Baseline conditions – Social

Population and demography

Demographic indicators such as life expectancy, fertility, mortality, dependency, and population growth rates were calculated and compared across provinces and areas of residence. Angola has a low aging index, meaning the population is predominantly young, with a high proportion of people aged 0-14 years and a low proportion of people aged 65 or over. The province of Cabinda has the lowest aging index and the highest urbanization rate in the country, with 44% of the population aged 0-14 years and only 2% aged 65 or over. The working-age population, aged 15-64 years, represents 55% of the population of Cabinda.

Land use

The province of Cabinda, Angola, has four main categories of land use: urban areas, industrial plots, agricultural areas, and forested areas. The forested areas cover the largest extent of the province and have different uses depending on the users and their objectives. Some users exploit the forest for commercial purposes, mainly for timber extraction and export, while others use the forest for family consumption, such as hunting, gathering, wood for construction and energy, and agriculture. The forest management is regulated by the Ministry of Agriculture and Rural Development, the National Directorate of Agriculture and Forestry, and the Forest Development Institute (IDF), which grants and supervises the licenses for forestry activity in Angola. The commune of Malembo has a specific land use related to the oil sector, where there are several companies operating in an industrial pole of national interest. Land acquisition for government use in Angola is governed by a set of legal frameworks and administrative procedures, designed to balance the needs of development and public utility with the rights of landowners and any occupants. The project site area, on the other hand, has no land use identified, as it is a grassland with few herbaceous plants and no evidence of land use by the local community. Any dialogue and feedback from potentially affected parties were managed by the Government and WSP has not been informed of any possible appeals to the process. During the ESIA process WSP relied on

the Ministry information. In addition, the public disclosure process did not highlight any previous or related disputes over land ownership, inadequate compensation, or delays in the legal process.

Economy and employment

Angola's economy is largely dependent on oil activities, but the government has been pursuing a National Development Plan to diversify the economy and create jobs. The country has experienced a recovery from a long recession since 2016, and achieved a real growth of 3.2% in the first half of 2022, driven by the increase in oil and gas production and the expansion of the non-oil sector.

The province of Cabinda and the commune of Malembo have a large oil sector, which accounts for about 70% of all oil exported by Angola, and a new refinery under construction, which will have a refining capacity of 60 thousand barrels of oil per day. The province also has several agro-industrial plants, and the government has invested in the Agricultural Promotion Program, which provides seeds, fertilizers, and livestock to the farmers. The population of Malembo is mostly engaged in agriculture and fishing, and some young people are involved in support services for the oil sector.

Education

Angola is a country with low educational development and faces many challenges in providing quality and equitable education for all. The country has made progress in increasing school enrolment and adult literacy, but still has a gender gap and regional disparities in education. The education policy in Angola is guided by national and international frameworks. The National Development Plan 2018-2022 defines several intervention priorities for education and higher education, such as improving teacher training, expanding pre-school education, promoting technical and vocational education, improving the physical and health conditions of students, developing the higher education and research system, and enhancing the evaluation and certification of higher education.

The province of Cabinda and the commune of Malembo, the area of influence of the project, have a total of 345 schools and 3,895 teachers, and an enrolment rate of 86% in primary schools and 14% in secondary schools. The literacy rate in the province of Cabinda is 87% and in the commune of Malembo is 32%, and the main challenges for education in the area are the distance to schools, the lack of public transport, the lack of school meals, and the financial conditions. It is noted the presence of a primary school at the Bissassanha Village, 4 km far from the airport boundaries.

Community health, safety and security

The healthcare system of Angola is regulated by the National Health Plan and the National Health Development Plan. The sector faces several challenges, including a scarcity of qualified human resources, insufficient health coverage, high rates of maternal and infant mortality, and high incidence of chronic and infectious diseases. The public health network is insufficient to meet the needs of the population, with inadequate infrastructure and an unbalanced distribution of resources. Despite these challenges, the state of health of the Angolan population has been improving, with increasing life expectancy and declining mortality rates. The health network in Cabinda consists of a municipal hospital, health centers, and medical posts, staffed by doctors and technicians. The health of the population has been improving due to the extension and improvement of health services. In the commune of Malembo, the health network consists of health centers and medical posts, staffed by a doctor, nurses, and traditional doctors. The main causes of mortality are malaria and arterial hypertension. The health system faces difficulties, including a lack of technical staff, drugs, and support services. In terms of safety and security, a significant proportion of the population in Angola and the province of Cabinda consider their residence to be unsafe. In the commune of Malembo, the most common crimes reported are theft of livestock and agricultural products.

Housing

Most households in the municipality of Cabinda live in their own housing, either self-built or built by a local contractor.

Water and Energy sources

In Angola, just over half of households have access to safe drinking water sources, with a higher percentage in urban areas than in rural areas. In Cabinda, 73% of households have access to safe drinking water sources, with significant differences among municipalities. The government of Cabinda is arranging the construction of a water collection and treatment system, the “Cabinda Water Supply” project, which would cover 92% of the population living in the province of Cabinda. In the Malembo Commune, water is obtained mainly through fountains, buckets, and wells of natural water.

Angola's electricity sector consists of 5 independent main systems based on hydroelectric plants. However, access to electricity is discontinuous and only 32% of households have access to the public grid. In the commune of Malembo, power supply is scarce and most neighbourhoods do not have electrical power from the grid.

Basic sanitation

In terms of basic sanitation, clean and non-shared facilities are important to prevent the transmission of diseases. In Angola, about one-third of households have safe and clean facilities, with a higher proportion in urban areas. However, more than half of households have unsafe facilities. In Cabinda, about 76% of households use a sanitation system connected to sewerage, but discharge of septic tanks is uncontrolled. Only 20% of households deposit garbage in proper facilities. In the commune of Malembo, there is no functioning basic sanitation network and most waste is burned and buried.

Mobility

Cabinda faces mobility challenges in terms of road, maritime and air transport modes. The road network of the province consists of 1,210 km, of which only a third is paved, and the main road (EN-100) connects the city of Cabinda to Belize, crossing two other municipalities. The public transport services are insufficient and unreliable, and most of the people and goods movement is done by private taxis, such as vans, motorcycles, and light cars. The maritime and fluvial transport is regulated by the National Maritime Agency, and the province has a pier bridge and a deep-water terminal under construction in Caio, which is part of the Cabinda economic growth. The existing airport of Cabinda, built in 1951, operates at the limit of its capacity and is in a dense urban area that hinders mobility. In October 2023, a survey was conducted to monitor road traffic near the NAIC project area. The aim was to assess the traffic flow on the EN-100 and EN-202 roads. The results of the survey showed that the EN-100 road had a higher traffic volume as compared to the EN-202 road. The traffic was mostly associated with the industrial sector and work commuting. However, there were no significant traffic peaks during the day, except for a slight increase at the beginning and end of the workday. Furthermore, the traffic reduced considerably on Sundays.

Human Rights

Angola is a country with medium human development and high fragility, according to the 2021 Human Development Index and the Fragile States Index. The government of President João Lourenço, who was re-elected in 2022, has adopted a National Human Rights Strategy and has increased the participation of women in parliament and ministerial portfolios. However, the country still faces serious human rights challenges, such as the repression of peaceful protests, the use of force by security forces, and the systematic violations of

workers' rights. The minimum wage in Angola is not a living wage and there is a discrepancy between the data reported by different sources.

Cultural heritage

Angola has a rich and diverse cultural heritage, which includes both material and intangible goods that have recognized value and legal protection. The province of Cabinda has a peculiar culture and history, as it was once part of the Kingdom of Ngoio and later became a Portuguese protectorate. Cabinda is rich in natural resources, such as oil, wood, gold, diamonds, uranium and phosphates, which have attracted the interest of various oil companies since 1915. The Cabindan population is ethnically and linguistically diverse, with the Fiote language being the second most spoken in the province, after Portuguese. The Cabindans have various religious beliefs, including the belief in a supreme creator, Nzambi-Pungu, and in invisible protective beings, the bakisi-ba-si, that mediate between God and the living.

Field surveys conducted in the Project area of influence revealed the presence of some sacred or historical places, such as cemeteries, churches, and a ritual site called Savulu Bukissi. However, only three elements/sites have been officially classified as cultural heritage in Cabinda, namely the São Tiago de Lândana Church, the Place of Concentration of Slaves, and the Historic Site of Slave Ship boarding. Therefore, more efforts are needed to preserve and promote the rich and diverse culture of Cabinda, which is under threat from various factors, such as urbanization, globalization, and environmental degradation.

Landscape and visual quality

Six main landscape units were identified in Cabinda: forests and natural habitats, greenfield and agricultural areas, water features, coastline, urban areas and industrial areas. Each unit is classified into one of three classes of visual quality (high, moderate, or low) and one of three levels of sensitivity (high, moderate, or low). Forests and water features are the highest quality and most sensitive units in Cabinda, as they are the most distinctive and rare features in the region, and they have conservation and recreation value. Greenfields, industrial areas and coastline are the lowest quality and least sensitive units, as they are common and degraded, and they have no remarkable visual or ecological value. Urban areas have moderate quality and sensitivity, as they vary in their density, design, and integration with the natural landscape. The project area of the airport is a low-quality and low-sensitivity landscape unit, as it is mainly covered by greenfield and industrial plots, and it has no significant visual or ecological value. The only exception is the low-density urban areas, which have moderate sensitivity due to the presence of local communities and settlements.

4.3 Baseline conditions – Biodiversity

Before fieldwork, a literature review, a desktop study and analysis of cartographic materials were conducted. The study resulted in a preliminary list of flora and fauna species potentially present within the project's area, a habitat map of Natural and Modified habitats, identification of protected areas within 50 km from the AoI, and an assessment of potential Critical Habitats. The literature review focused on documenting available information on species and ecological features of conservation concern, considering scientific and "grey" literature, as well as various sources and documents such as Terrestrial Ecoregions of the World, Freshwater ecoregions of the world, Copernicus Global Land Cover, Google Earth Pro, The Global Forest Watch, Key Biodiversity Areas, World Database on Protected Areas, The IUCN Red List of Threatened Species, Bird Life International, and Angola National legislation.

Habitat mapping

A preliminary habitat map was created using the Land Cover Maps produced by the Copernicus Global Land Service. The document notes that the closed forest and open forest types are unknown at this stage of the analysis. Closed and open forest patches within a buffer zone of 2 km are assumed to be remnants of primary

forests, which are mature natural humid tropical forest cover that has not been cleared and regrown in recent history. Primary forests play a crucial role for ecosystem services and biodiversity conservation, and they are a target of many policy initiatives.

Flora and Habitat

Field surveys of flora and habitat were conducted in 2023 by Saioz's experts under WSP direction and supervision. The surveys aimed to evaluate the baseline conditions of the biological components within different buffer zones, to support the preparation and refinement of the habitat map and the lists of flora species potentially present. They used a combination of habitat screening, plot surveys, and species identification to assess the habitat types, quality, diversity, and conservation status within 2 km buffer zone of the project. The surveys also identified the main potential threats and disturbances for the habitats and the flora species, such as grazing, soil erosion, dust deposition, and human activities. The surveys faced some difficulties such as inaccessibility of locations, the presence of minefields, and the possibility of armed threats, which required some adjustments of the sampling points and the methodological approach. From the surveys no threatened or protected species were identified as present withing the 2km AoI.

Herptile and freshwater species

Field surveys of herptile and freshwater species were conducted in 2023 by Saioz's experts. The surveys aimed to collect data and information for amphibians, terrestrial reptiles, arthropods, fish and mollusks in differentiated buffer zones (2 km, 5 km, and 50 km), and to investigate the potential presence of Target Species. The surveys used a combination of visual encounter survey (VES), audio encounter survey (AES) and dip netting (NET) to detect the presence and abundance of the species, especially in aquatic ecosystems.

The surveys were carried out in two campaigns, one in March and one in October, corresponding to the final and the beginning of the rainy season, respectively. No threatened or protected herptile and freshwater species were identified as present within the 2km AoI.

Birds and bats

Birds and Bats surveys were conducted during two field seasons in March and October 2023. Birds were surveyed using vantage points, where observations were made from fixed positions within a 50 km buffer zone from the Project. Bats were surveyed using a combination of internal and external visits to possible roosting places, focusing on finding habitats with the highest potential for hosting bats within the Project Area of Influence (50 km).

During the second field survey, nocturnal echolocation was also carried out using a bat detector. Surveys were conducted in selected habitats, stopping to scan priority habitats/features suitable for the presence of birds and bats. Literature suggests Angola has 940 species of birds with 16 endemics. During the field studies 95 species were directly observed, including the Grey Parrot. Few species of bats have been observed on site.

Mammals

Two surveys on Mammals have been completed in March and October 2023. Mammals and Micromammals were surveyed using a combination of linear transect, camera trap, Sherman traps, and any other incidental sightings. At each Survey Point, direct and indirect observations were investigated through linear transect proceeded in the four cardinal directions. Surveys were conducted in selected habitats, targeting micro-habitats suitable for the presence of mammals. No threatened or protected mammals were identified as present within the 2km AoI.

4.3.1 Critical Habitat Assessment

According to the results of the Critical Habitat Assessment, there are seven species that could potentially trigger critical habitat (CH) for two of the criteria of the IFC PS6. Out of these seven species, two are mammals (the African forest elephant and the chimpanzee), four are birds (the Grey Parrot, the Rufous-bellied heron, the Cape Gannet, and the Cape Cormorant) and one is a bat (the Hayman's dwarf epauletted fruit bat).

During the two-field surveys conducted, the two mammal species were not directly observed. The potential presence of these species was considered unlikely due to the use of adjacent habitats, habitat fragmentation, and the environmental conditions present within the AoI. However, a consultation with the IUCN Great Apes Task Force was initiated due to the potential presence of chimpanzees. The task force confirmed that no data are available in Cabinda, therefore, a recommendation was made for further monitoring through camera traps for a longer period.

Out of the four bird species, the Grey Parrot was directly observed during the first field survey. However, the other three bird species were not observed during the two-field surveys, but their potential presence cannot be completely ruled out due to their ethology and the ecology of the AoI. It is recommended to conduct a longer period of monitoring data collection to determine if there are sensitive colonies on the coast or in the forest nearby the Project's footprint.

Similarly, the bat species, the Hayman's dwarf epauletted fruit bat, was not observed during the two-field surveys, but due to its ethology and ecology of the AoI, the potential presence of this species cannot be completely excluded. Therefore, a longer period of monitoring data collection is recommended.

5.0 STAKEHOLDER CONSULTATION

In accordance with international requirements, an effective Stakeholder Engagement process was conducted with affected communities and, where relevant, other stakeholders.

The Stakeholder Engagement process has been ongoing since the beginning of the ESIA process. The Stakeholder Engagement was conducted through two main activities, meetings and consultations with representative stakeholders and surveys with samples of stakeholders for the collection of baseline information. The meetings allowed involving a wide range of representative stakeholders, including local associations' representatives, Municipal Departments representatives, Communal administration representatives and Police officers. Below is a list of the major points discussed and of the outcomes:

- OEC and the stakeholders will periodically communicate for keeping both the stakeholders and the communities informed on the status of the Project;
- NAIC is expected to generate a socio-economic development through an increase of jobs opportunities directly and indirectly linked to the Project;
- The Literacy Programme carried out in 2023 by OEC has been widely appreciated by the local associations, the authorities and the community so it will be extended to more participants in 2024;
- The local associations identified the local recruitment process as a priority;
- OEC agreed with the Council Representatives to bring proposals, in January, on how to use a space provided by the Council to train the local community. The trainings will focus on skills valuable for the employment sector in the area of influence;
- The National Police will keep the NAIC area security under its control.

The results of these Stakeholder Engagement process have been considered when defining the impact assessment and identifying the mitigation measures. The engagement will continue in the future Project phases and will be based on the results of the previous activities.

6.0 SUMMARY OF PROJECT ENVIRONMENTAL AND SOCIAL IMPACTS

The impact assessment conducted according to the Project standards included the identification, assessment, and quantification of the potential direct and indirect, positive and negative environmental (i.e., physical and biological) and social impacts associated with the Project, as well as risk of accidents, if any identified.

For the positive impacts identified, the ESIA reported the measures to be implemented for enhancing the positive effects of the Project on the local communities and the economy. For the adverse impacts identified, the ESIA defined relevant mitigation measures to avoid, or where avoidance is not possible, minimize, mitigate or compensate the adverse impacts (as per the mitigation hierarchy). The mitigation measures served as bases for preparing the Environmental and Social Management Plans, part of the Project Environmental and Social Management System.

6.1 Positive impacts

The Project will have modern infrastructure and capabilities for attracting investments for developing the surroundings (e.g., industries, manufacturing and logistics companies, hospitals, educational buildings). Specifically, the main positive impacts of the Project are:

- **Enhancement of the local economy.** NAIC development is expected to lead to an economic growth for the whole province. With the increase of workforce, direct sales to workers (e.g., food and small everyday items) are expected to grow along with accommodation in the city. Also, an increase of tourism (i.e., increase of hostels, hotels, restaurants and commercial activities revenues) is expected. NAIC construction and operation will also benefit the companies involved in the procurement of goods, materials and services;
- **Increase of employment rates.** A boost in the local job market is expected. A significant number of jobs opportunities (both directly and indirectly linked to NAIC) may arise from airlines and service providers and will regard mainly the local communities and households. The increase of the employment rates will generate positive effects on the income of the workers but also on the overall livelihood conditions of their households. Also, the workforce training programs will be useful for future employment opportunities;
- **Improvement of road network and of the overall mobility services and infrastructures.** The easy access to transportations and the improvement of the road network, mobility services and infrastructures will benefit the local communities by making easier to travel in Angola and worldwide. The road network amelioration is also expected to mitigate the increased traffic that will be generated by the Project operation.

6.2 Adverse impacts

Adverse impacts on the social, biological and physical components were identified for both the Project construction and operation phases. The main adverse impacts and risks associated with the Project are:

- **Emissions of pollutants (gaseous pollutants, GHG and dust and particulate matter) in the atmosphere and degradation of the air quality during both construction and operation phases.** The construction activities generally lead to an overall increase of dust and particulate emissions deriving from the equipment and machinery operation and from the excavation activities. The emissions of air pollutants expected from NAIC operation, instead, will likely consist of exhaust emissions issued by engines and support equipment operation (e.g., emergency generators), dust and particulate matter deriving from the increase of road traffic and GHG emissions, which are intrinsic characteristics of airports;

- **Increase of noise emissions.** Considering the Project location and the absence of receptors in the proximity of the construction area, the impact calculated for noise for the construction phase was low. However, even though no operation noise assessment was conducted yet, is well known that high noise emissions are intrinsic characteristics of airports;
- **Generation of solid waste and of wastewater**. The generation of solid and liquid waste represents an adverse impact because of the lack – in Cabinda Province – of a proper collection/management/disposal system of solid and liquid waste. The existing facility for the solid waste management (i.e., Yema landfill) does not meet the Project standards so is not a considerable option. No landfills or recovery plants are locally available. Also, Cabinda has no wastewater collection system for managing the liquid waste (i.e., no public sewage system available). OEC has considered alternative solutions to avoid the use of Yema dumpsite which have been considered adequate and compliant with international requirements.
- **Impacts on the habitats and ecosystem:** the results of Critical Habitat Assessment show that 7 species could potentially trigger critical habitat for 2 of the IFC PS6 criteria. Although the species have not been directly observed on site during the 2 surveys, literature data are too limited to exclude totally their presence. For this reason, the impact on the habitats is considered high. It is therefore suggested to carry out a longer period of monitoring data collection during construction phase. These data will serve to prepare the Initial Wildlife Hazard Assessment and the Wildlife Management programme with specific measures to be adopted during operation phase as required by ICAO *Wildlife Management and Control Regulatory Framework & Guidance Material.*
- **Impacts on fauna:** From the surveys, no threatened or protected mammals, herptile and freshwater species were identified as present within the 2km AoI. However, some other small and common mammal species could be directly affected within the Project's footprint through noise and light disturbance, vehicular collision, etc. during both construction and operation phases. Different consideration needs to be done regarding impacts on the avifauna which is considered potentially significant (high). An increasing level of disturbance and pollution, as well as the increased collision risk could impact bird species within the AoI. Migratory birds are likely to alter their flight paths as a result of increased air traffic. Regarding Bats few species have been recorded on site. Increased levels of disturbance and pollution, as well as the increased collision risk (from plane numbers) could impact bat species within the AoI. Whilst local bat species are likely to be scarcely affected from night activities (flights should be during the day), the increased noise levels, artificial light, and vibrations could harm these animals.
- **Impact on flora:** Because of the herbaceous vegetation (habitat: shrub savanna) in the project footprint, these flora species will directly be impacted and will be lost during the construction. Moreover, indirect impact on flora species are expected also within 1 and 2km from the airport's footprint due to the disturbance, by accidental introduction and spreading of alien species, and reduction in air quality and dust fallouts, leading to habitat degradation.
- **Influx of population:** The influx of population resulting from the development of a new airport can have various impacts on population and demographics. Increase of population can lead also to an uptick in certain types of crimes such as traffic violations, property crimes especially if enforcement measures are not scaled adequately. High profile infrastructures such as airports can become targets for security threats therefore there might be the necessity to increase security resources to safeguard the airport and surrounding areas.
- **Demand for workforce:** The demand for workforce is diverse and multifaceted being airports complex facilities that require a wide range of skills. Because the Project will replace the existing Cabinda airport there are still some uncertainness on the workers transfers, their comfort in changing the working place.

Working conditions are managed following Angolan legislation and there are no sufficient guarantees to ensure workers well-being and transparent information.

It should be considered that, for both construction and operation phase, the residual impact calculated – thanks to the proper application of the mitigation measures provided – is lowered compared to the initial risk.

6.3 Human Rights Risks

The Project entails human rights risks and impacts that could potentially cause adverse impacts on human rights. The following main human rights have been identified as potentially at higher risk for the Project.

- **Labour Rights Risks:** The government has in place several labour laws protecting human rights, however they are often considered ineffective. The Project is recommended to develop and implement a Human Resource Policy with labour commitments that explicitly prohibits the use of child labour and forced labour, as well as commitments to promote fair treatment, non-discrimination, and equal opportunities for workers on the Project, as well as promote the health and safety of workers at work.
- **Supply Chain Risks:** The Project will include use of goods and equipment for construction, the upgrade of the local access road, the construction of temporary accommodations and a permanent residence for workers and the construction of a overhead transmission line. The contextual risks in Angola increase the probability of the infringement of human rights at some point and make it more difficult for the Project to control that the company's required are applied by all the involved parties. As risks are high, mitigation measures must be implemented to significantly reduce the risk level. This includes the preparation of a Supply Chain Management Plan outlining the mitigation measures to be applied such as the assessment of suppliers during the procurement phase and a periodic auditing system,

A robust environmental and social management system has to be established to ensure that mitigation measures identified within the ESIA are systematically implemented and monitored.

6.4 Climate Change Risks

6.4.1 GHG Calculation

In accordance with international requirements, a site and Project-specific GHG calculation was conducted. The GHG Inventory has considered two different time frames for the estimation of GHG emissions: the average year during Phase 1 of the airport's operations, until 2032, and the average year in Phase 2, after the projected airport expansion, until 2050. The GHG assessment covers the accounting and reporting of seven greenhouse gases covered by the Kyoto Protocol – carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PCFs), sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3).

Following the GHG Protocol definition of direct and indirect emissions and scopes, GHG emissions are accounted for under three broad categories, Scope 1 (Direct GHG emissions), Scope 2 (Indirect GHG emissions from the generation of purchased electricity, heat or steam consumed by the airport) and Scope 3 (other indirect GHG emissions). The results summarize the contribution of each source to the annual overall emissions in tCO2e for the Project phase 1 and phase 2. For both the phases considered, the Project annual GHG emissions are not expected to exceed the threshold limit value of 100,000 tCO2e, that triggers different assessment and information disclosure requirements. It is important also to note that the Project is not to be considered as an additional GHG source in the context of Angola, but rather as a replacement for an existing airport facility.

6.4.2 Climate Change Risk Assessment

The Climate Change Risk Assessment provides a screening of climate hazards that may affect the Project area of interest, and, for each hazard, it determines a risk level in consideration of the Project's sensitivity and exposure, and of its ability to adapt to increasing climate hazards over a temporal scope of up to 80 years.

Mitigations are finally proposed for consideration in the detailed design for the Project and in the Environmental and Social Management Plans. There are two categories of climate risks, the Physical Risk, relating the physical impacts of climate change, and the Transition Risk, which includes the risks related to the transition to a lower-carbon economy. WSP conducted both a Physical and a Transitional Climate Change Risk Assessment.

The physical risks resulting from climate change can be event-driven (i.e., acute) or longer-term shifts (i.e., chronic) in climate patterns. Acute physical climate risks can include increased severity and frequency of droughts, storms, floods, heat waves and wildfires. Chronic physical climate risks can include sea level rise and longer-term temperature increase. Climate-related physical risks may include a variety of effects (e.g., direct damage to assets as a result of extreme weather events, changes in water availability, sourcing and quality - often with consequent social impacts - and adverse impacts on employee/community safety). WSP proposed a few measures to be adopted for reducing the climate risks for the hazards considered in the assessment. The measures were organized according to the time-horizons set up above (short-term, mid-term and long-term) and refer to extreme heat, droughts, severe storms, extreme precipitation and wildfires risks.

The climate transition risk is the risk associated with the transition to a low-carbon and resilient economy. It refers to the potential financial impacts and disruptions that businesses and financial institutions may face as a result of policy, legal, technological, and market changes aimed at addressing climate change. Transition risks arise from efforts to mitigate greenhouse gas emissions and transition to a more sustainable and low-carbon economy. These risks can include regulatory changes, shifts in market preferences and demand, changes in technology and innovation, and evolving societal expectations. They can lead to significant financial implications, such as asset write-downs, stranded assets, reduced market share, increased operating costs, or disrupted supply chains. Based on the comprehensive analysis of projections from various scenarios, it is evident that the transport sector in Angola will gradually witness a reduction in direct CO2 emissions, attributed to the ongoing efforts to decrease operational activities' emissions. This trend suggests a growing need for the Project to adapt its infrastructures to align with the changing energy landscape and reduce its reliance on fossil fuels over time embracing renewable energy, sustainable transportation options, and proactive infrastructure adjustments.

The current status of the Project does not allow full Physical and Transition risk assessments. There would be needed additional detailed design elements and strategy for the airport management which are currently to be defined. For reducing the risk and adapting the Project to the evolving risks and to guide the Project towards a medium-term low carbon strategy, it is strongly recommended the preparation of a Climate Adaptation Plan (i.e., a living document to be periodically reviewed, to be organized according to short, medium, and longer-term timescales, covering the period up to 2050). The Plan will be the result of consultation with Government and key parties involved in the process. ICAO Climate Resilient Airport toolkit could be a valid guidance reference and may provide some good foods for thought.

6.5 Cumulative Impacts

Because of the presence of other ongoing and new planned projects in NAIC surroundings, there might be the potential to result in cumulative impacts with the Project, based upon their scale and location. The projects identified are:

- Malongo Oil Complex Terminal, in operation, located on the E220 road (Futila – Malembo), 2 km from NAIC;
- Malembo Thermal Power Station, in operation, located on the E220 road (Futila – Malembo), 1 km from NAIC;
- Port of Caio, under construction, located in Caio bay, 10 km from NAIC;
- Cabinda Refinery, under construction, located on the E220 road (Futila – Malembo), 1 km from NAIC; and

- Overhead transmission line from Malembo Thermal Power Station to Buco Zau, to be constructed (i.e., location to be defined).

The cumulative assessment preliminarily conducted concentrated on the two projects which are currently under construction (i.e., Port of Caio and Cabinda Refinery) because of the higher potential, in addition to NAIC, for situation of stress to the environment. The potential occurrence of cumulative effects has been considered as being possible during both construction and operations phases. For mitigating potential adverse cumulative effects a few measures should be adopted. For example, efficient measures may be engaging with local authorities, public entities involved and private project developers and developing a Cumulative Impact Assessment at Government level (to evaluate the cumulative impacts for a larger area, before starting the operations or when data of all project designs are available).

6.6 Unplanned events

Unplanned events are not expected to occur during the Project's normal construction and operational phase activities but are considered possible, although they are unlikely. Possible unplanned events that may occur in the construction phase are considered to include traffic accidents, fires and explosions, damage to third party assets and release of liquid fuel from tanks at the Project site These events represent a risk of the construction phase but may occur also during Project's operations. Possible unplanned events for the operational phase include geophysical hazards (major identified are extreme heat, storms and cyclones), deliberate attacks or damage to project facilities, fires and explosions, cybersecurity, bomb threats, air crashes and epidemics. For all these possible unplanned events, the ESIA concludes that they are unlikely or extremely unlikely; in case any will occur, their consequences will be limited and localized, and mitigation measures presented in the ESIA (specifically, in the Emergency Preparedness and Response Plan) are considered sufficient to lower their effects or make it negligible.

7.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

The Environmental and Social Management System developed for the Project is aimed at implementing all the mitigation measures identified during the impact assessment and ensuring the environmental and social performance of the Project. Such Environmental and Social Management System was developed according to the Project standards and regulations, with the commitments undertaken in the impact assessment. The management system incorporates the following elements:

- National and International laws and regulations and the International conventions;
- Identification and assessment of environmental and social risks and impacts;
- Procedure to manage any Project change that may result in additional or different impacts and risks;
- Environmental, Social, Health and Safety Policies;
- Environmental and Social Management Plans;
- Roles and Responsibilities for implementing the management procedures;
- Training and awareness procedures to implement the Environmental and Social Management System and manage Project impacts;
- Stakeholder Engagement Process;
- Emergency Preparedness and Response Plan and procedure to respond to unplanned and non-routinary events that may generate emergencies; and

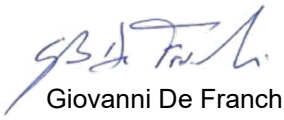
- Environmental and Social Management System audit, monitoring, review, and performance reporting for ensuring and keeping the highest performance possible.

WSP developed a specific set of sector-specific Environmental and Social Management Plans for the construction phase covering the physical, biological and social components. The plans were shared with contractors and subcontractors for their implementation.

Signature Page

WSP ITALIA S.r.l.

Barbara Scorza
Project Manager



Giovanni De Franchi
Project Director

C.F. e P.IVA 03674811009
Registro Imprese Torino
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Capitale sociale Euro 105.200,00 i.v.

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