

*Environmental and Social Impact Assessment
Study:
Aircraft Hangar and Center of Excellence Aviation
Training Center Project*



Nyarugunga Sector - Kicukiro District - Kigali City

Developer: AKAGERA AVIATION LTD



May 2023

EXECUTIVE SUMMARY

Introduction

Environmental and Social Impact Assessment (ESIA) is a process of meticulous assessment of environmental impacts. It was introduced for the purpose of identifying /evaluating the potential benefits or adverse impacts of development projects on the surrounding environment consisting of land, air, water, and biological factors, considering environmental, economic, social, cultural, and aesthetic considerations. For evaluating the impacts of the proposed Aircraft hangar and Center of Excellence (CoE) aviation training centre project, all activities associated with planning, design, site preparation, construction, operation, and maintenance within the proposed project site and area of influence were considered. All these considerations help decision makers & project planners to develop proper mitigation measures since the early stage of the project and during the different phases.

The aim of an ESIA is to ensure potential impacts are identified and addressed. For this purpose, an Environmental and Social Impact Assessment (ESIA) Report has been prepared to assess baseline environmental conditions at the site and an Environment and Social Management Plan (ESMP) has been prepared to execute the project with minimum pressure on the natural resources and negligible impacts on the environment. The study area to be considered for the purpose of assessing the impacts on the environment has been determined as per the applicable national EIA guidelines and AfDB Integrated Safeguard System.

Objective of the Study

The objective of this study was to evaluate the environmental and social impacts of all works related to the construction of the Aircraft hangar and CoE aviation training centre, in the Kicukiro District of Kigali city. The study has considered the pre-construction, construction, operation, and decommissioning phases of the proposed project.

Methodology

An ESIA scoping exercise was undertaken at the beginning of the project, during the preparation of the feasibility study (FS), which was the first stage in the assessment of E&S impact of the project. The scoping exercise involved review of literature and field visits that generated the spatial dimensions and data on the zones of influence of the project.

Furthermore, to identify and predict the various impacts that may emanate from the project, various study methods and tools were incorporated. These included checklists, expert opinions, and observations. An in-depth analysis of public concerns from the interested parties was undertaken and views incorporated in the development of the Environmental and Social Management Plan (ESMP). This involved discussions and dialogue with the key stakeholders: Ministry of Environment (MoE), Ministry of Infrastructure (MININFRA), Ministry of Local Government (MINALOC), Ministry of Gender and Family Promotion (MIGEPROF), Rwanda Environment Management Authority (REMA), Rwanda Civil Aviation Authority (RCAA), Rwanda Development Board (RDB), Rwanda Standards Board (RSB), Rwanda Utilities Regulatory Authority (RURA), Water and Sanitation Corporation (WASAC), Aviation Travel and Logistics Holding Limited (ATL), Kicukiro District, Akagera Aviation Ltd, Rwanda Airports Company (RAC), RwandAir, Rwanda Air Force, Rwanda National Police, NGOs, Local communities, and project engineers.

Overview of the proposed development

The Government of Rwanda considers the transportation sector to be a significant driver of economic growth. To attract both domestic and foreign investment in the country, it recognizes the importance of enhancing the quality and dependability of transport services while reducing costs. To this end, the

government has implemented a comprehensive investment plan and capacity building program that includes expanding Kigali International Airport and other domestic airports, establishing a Center of Excellence aviation training center, providing air navigational services, constructing a new international airport, and supporting the growth of the national carrier, RwandAir.

It is in this context that Akagera Aviation Limited (developer) intends to construct an aircraft hangar capable of accommodating 8 Beechcraft King Air size aircraft at the Kigali International Airport. Additionally, they propose the creation of a Center of Excellence (CoE) aviation training center, to serve up to 490 students. The CoE will offer different aviation training/courses such as Pilot training, Maintenance training, Cabin crew, Dispatch, Ancillary courses, Air Traffic Management Courses, Aeronautical information services, Aeronautical meteorological services, Aeronautical communications operations, Communication Navigation and Surveillance, Airport Emergency Services (Operations), and other supporting programs. The CoE will partner with higher learning institutions to provide academic aviation courses.

Given the increasing importance of drones' applications in Rwanda, the CoE will also provide drone piloting training along with other manned aircraft pilot training courses such as, Private Pilot License classroom (PPL), Commercial Pilot License (CPL) training, Airline Transport Pilot License (ATPL), Flight Simulator Recurrent training and other advanced pilot training for specialized missions.

Project objectives

The aviation industry in Rwanda is experiencing rapid growth and has set its sights on becoming a leading center for aviation excellence. As part of this goal, the objective of the proposed CoE in aviation training center and aircraft hangar project is to provide training for pilots, maintenance staff, air traffic management personnel, and other related fields. The aircraft hangar will also serve as a shelter for aircraft and a facility for technical activities. The overall aim of these initiatives is to build local capacity and empower the labor force in the aviation industry not only in Rwanda but also in the region and beyond.

The project is detailed below as per the activities and phases:

Preconstruction phase: Reconnaissance of the projected site; Identification of alternative sites; Pre-feasibility and feasibility studies of the chosen construction site.

Construction phase: It is estimated the construction will take a period of 24 months. Construction of the Aircraft hangar and CoE aviation training center will involve; Site fencing and managing site access and contact points; Construction of the hangar and academy training center facilities, involving land clearing, excavation, foundation works, levelling, and finishing; Soil preservation, Installation of plumbing and electrical fixtures. Pollution generation control and management during construction works.

Operation phase: Use of the Aircraft hangar and CoE aviation training center facilities.

Decommissioning phase: Demolition of the Aircraft hangar and CoE aviation training center facilities and management of debris formed during breakdown of the units. Reuse of other construction materials without carelessly disposing of them.

The connection between the proposed project and Kigali International Airport.

The proposed project components will be connected to various existing facilities at the Kigali international airport. These facilities include:

- The existing runway, which is a designated strip of land that will be used for takeoff and landing of aircraft during training.

- The existing apron will serve as the area where aircraft will be parked, refueled, and boarded.
- The existing stormwater drainage system will be used for collecting and draining excess rainwater from the proposed facilities, ensuring that it does not interfere with the airport's operations.

The proposed components of the project will be linked to several other facilities already present, including the Akagera aviation offices that will serve as both administrative and operational facilities. Additionally, the project will depend on the current power supply for electricity and use water connections and tanks to provide the water required for the airport's operations. Lastly, the existing fuel tanks will be used to store fuel for the aircraft, ensuring a consistent fuel supply for the airport's activities.

Project cost & staffing

Cost estimation involves predicting project expenses, including materials and labor. The project's total cost amounts to \$53.5 million USD, divided into infrastructure and equipment expenses of \$29.1 million USD and \$24.4 million USD, respectively. The construction phase will require up to 1000 workers while the operation phase takes up to 98 workers.

Policy, Legal and Institutional Framework

This section of the ESIA Report details the Policy, Legal and Institutional Framework for the proposed project, covering national requirements as well as applicable international treaties and conventions, and AfDB Operational Safeguards voluntarily committed to Akagera aviation Ltd. The intent of this section is to lay out the regulatory and non-regulatory performance requirements for all stages of the proposed project.

This section described the pertinent regulations and standards, at both the international, national, and local level, that govern environmental quality, health, safety, protection of sensitive areas, protection of endangered species, land use control, etc. It also described the current administrative arrangements for environmental regulation, enforcement, and management in environmental and social management issues, to ensure that ESIA will be effectively implemented.

The ESIA report comprised the most pertinent laws and regulations for the proposed project, along with compliance requirements and their alignments, which will guide the development and implementation of the aircraft hangar and CoE aviation training center project. For the policies and standards, it has been demonstrated how the project aligns to the existing policies in consideration of the relevant standards.

Most relevant policies are stated below:

The Rwanda Development Vision, 2050 The vision statement recognizes the environmental problems facing the country due to poor planning and management of environmental resources arising from issues such as poverty and ignorance. The proposed CoE aviation training center aligns with Rwanda's Vision 2050 and aims to improve human capital through education by providing high-quality training, upskilling previously unskilled labor, and transforming the workforce for higher productivity. It will attract and sustain high private investment, promote higher public investment, and ultimately lead to a more skilled workforce, which will contribute to the achievement of Rwanda's development goals.

National Environment and Climate Change Policy 2019: The policy seeks to provide strategic direction on environment and climate change in Rwanda, bearing in mind its linkages with our socio-economic development. The proposed project's implementation as a green building aligns with efforts to reduce greenhouse gas emissions and adapt to climate change impacts while promoting socioeconomic development. This will be achieved through the use of low-carbon materials in construction and waste management practices that support emission reduction.

National Policy on HIV/AIDS, 2003: The policy will be considered during the ESIA process and mitigation/management measures will be developed to promote measures of prevention of HIV&AIDS transmission, as outlined in this policy.

National Land Policy, June 2019: In alignment to the policy, the proposed project will ensure sustainable land management, through the utilization of land for productive and development purposes without compromising its use by future generations and promoting locally produced and environment-friendly construction materials.

Kigali City Master Plan, 2050: The proposed aircraft hangar and CoE aviation training center project in Kigali will be designed sustainably in accordance with the city's Masterplan 2050 and zoning regulations and will incorporate green technologies.

Health Sector Policy, 2016: The construction and operation of the proposed project will be aligned to this policy by ensuring health and safety on the project sites and implement awareness programme on HIV/AIDS, child abuse, SH, Malaria...etc.

The National energy policy, 2015: The overall goal of the policy is to ensure that all residents and industries can access energy products and services that are sufficient, reliable, affordable, and sustainable. The proposed project will align with the requirements and objectives of the National Energy Policy. The project will rely on energy during these stages and will incorporate solar panels to ensure efficient energy usage of the facilities.

Rwanda Green Growth and Climate Resilience, (GGCRS, 2011): In alignment to this strategy, the proposed project will adopt energy and water efficiency, waste recycling, and sustainable building materials to maintain a low carbon system. Additionally, it will utilize renewable energy sources and implement green building design to reduce emissions and ensure long-term sustainability.

Rwanda Biodiversity Policy, 2011: The policy seeks to identify and control all potential sources of adverse impacts on biodiversity and carrying out environmental impact assessments of projects likely to have "significant adverse effects" on biological diversity.

National Occupation Safety and Health Strategies: The aircraft hangar and CoE aviation training centre project must develop and implement an OSH policy in line with national regulations, conduct risk assessments, establish an OSH management system, and provide personal protective equipment to employees.

National Urbanization Policy, 2015: The aircraft hangar and CoE aviation training centre project will promote sustainable development through eco-friendly practices, engage with relevant stakeholders, and contribute to human resource development by providing high-quality training in the aviation industry.

National Gender Policy, 2021 aims to achieve gender equality and equity in Rwanda by promoting gender mainstreaming and equal access to economic resources and opportunities. The policy is structured around priority areas such as engendering national planning frameworks and accelerating women's economic empowerment. The proposed project will prevent gender discrimination and violence and promote women's leadership in aviation through training and mentorship programs.

The most pertinent laws for the proposed project.

Law on Environment No 48/2018 of 13/08/2018: This law aims at conserving the environment, people and their habitats and setting up strategies of protecting and reducing negative effects on the environment and

replacing the degraded environment among others. The law applies to various aspects of the intervention, therefore the ESIA process is being conducted to comply with the requirements of the Law.

Land Law N° 27/2021 of 10/06/2021: In compliance with this law, principles applicable to rights recognized over all lands situated on Rwanda's national territory and all rights united or incorporated with land, whether naturally or artificially must be considered. All project activities that are likely to pollute underground sources will be carried out in a manner of protecting, conserving, and exploiting land in a productive way.

Law N° 58/2018 of 13/08/2018 on Mining and Quarry Exploitation: Although the mining activities at the quarry are not perceived to be a primary activity. The Mining law must be implemented to ensure the protection and rehabilitation of the biophysical and socio-economic environments as well as the adequate management of borrow pits and quarries.

Law N° 064/2021 of 14/10/2021 governing biological diversity: Biodiversity is considered a high-level project receptor, therefore, during the implementation and operation of the proposed project, the developer shall consider the list of protected species as a measure to avoid negatively affecting protected species; avoid introduction of alien species to the site as instructed by this law; and take all action to protect and conserve the biological diversity in the project's area of influence.

Ministerial Order No 001/2019 of 15/04/2019: This law establishes the List of Projects that must undergo Environmental Impact Assessment, instructions, requirements, and procedures to conduct Environmental Impact Assessment.

The Law N° 028/2019 of 19/09/2019 aims to ensure civil aviation safety and prevent unlawful interference. The developer of the aircraft hangar and CoE aviation training centre will comply with the law by obtaining necessary licenses and certifications, implementing a comprehensive security program, conducting background checks, implementing access controls, providing security awareness training, and conducting regular security drills. They will cooperate with RCAA officials to ensure compliance.

Rwanda Green Building Minimum Compliance System is mandatory for new buildings in certain categories and comprises of five focus areas: energy efficiency, water efficiency, environmental protection, indoor environmental quality, and innovation. The developer of the aircraft hangar and CoE aviation training centre should incorporate energy-efficient design features, use environmentally friendly building materials, and water-efficient fixtures and equipment. Additionally, the developer should implement a waste reduction and recycling program and educate staff and visitors on sustainability practices.

Law No. 20/2018 establishing regulations governing civil aviation in Rwanda: The law establishes a legal framework for the regulation of air transport services, aircraft operations, airworthiness, and aviation personnel licensing. It established the Rwanda Civil Aviation Authority as the regulatory body responsible for the oversight and supervision of civil aviation activities in the country. The law covers a wide range of aviation-related matters and seeks to ensure the safety and security of civil aviation operations in Rwanda. The law provides regulations for aircraft registration and certification, air navigation services, aerodrome, airfield management, and air transport operations, among others.

The Rwanda Civil Aviation Authority (RCAA) strategic plan for 2019/20-2023: The proposed aircraft hangar and CoE aviation training centre project can comply with the RCAA's objectives by implementing safety and security standards, improving service delivery, strengthening institutional capacity, and investing in infrastructure development.

The Rwanda Building Code (RBC) regulates and monitors the design, construction, and use of buildings to safeguard public health, safety, and general welfare. Compliance with the Rwanda Building Code is

mandatory for all building and related non-building structures in Rwanda. The aircraft hangar and CoE aviation training centre project must comply with the RBC guidelines on site selection, structural safety, fire safety, accessibility, plumbing, and sanitation, electrical systems, energy efficiency, and building materials.

Description of the AfDB Operational Safeguards and project categorization

Operational Safeguard 1: Environmental and social assessment

The objective of this overarching Operational Safeguard (OS), along with the OSs that support it, is to mainstream environmental and social considerations including those related to climate change vulnerability into Bank operations and thereby contribute to sustainable development in the region.

Operational Safeguard 3: Biodiversity and ecosystem services

This Operational Safeguard (OS) outlines the requirements for borrowers or clients to (i) identify and implement opportunities to conserve and sustainably use biodiversity and natural habitats, and (ii) observe, implement, and respond to requirements for the conservation and sustainable management of priority ecosystem services.

Operational Safeguard 4: Pollution prevention and control, hazardous materials, and resource efficiency.

This OS outlines the main pollution prevention and control requirements for borrowers or clients to achieve high-quality environmental performance, and efficient and sustainable use of natural resources, over the life of a project.

Operational Safeguard 5: Labor conditions, health, and safety

This OS outlines the main requirements for borrowers or clients to protect the rights of workers and provide for their basic needs.

The proposed aircraft hangar and CoE aviation training centre is categorized as Category 2 per the AfDB OS1 requirements.

Project Alternatives

In this section, practical alternatives to the proposed project's site, waste and stormwater management, electricity, and water supply as well as the "no project" scenario, were systematically compared in terms of their potential environmental and social impacts, the viability of mitigating these impacts, their capital and recurrent costs, their suitability under local conditions, and their institutional, training, and monitoring capabilities.

Under no project alternative, the proposed project would not be constructed, and the project site would remain in its current condition, or later used for other developments other than aircraft hangar and CoE aviation training centre project. If the proposal fails to receive the anticipated approval, the project will not be implemented. However, this would need to be balanced against the fact that there would also be no beneficial impacts associated with the Project not being implemented such as to empower labor in aviation industry by providing qualifications in the aviation field to serve local (Rwanda) and regional needs as well as provide shelter for fixed wing, rotary wing, maintenance/engineering and other technical aircraft activities. In addition, it would mean foregoing approximately 53.5 million USD investment in the local economy, as well as provision of jobs for skilled and non-skilled workers. This will impact negatively on the proponent's investment plan. This alternative would not be suitable.

For alternative sites, the proposed aircraft hangar and CoE aviation training centre project will be located in Kicukiro district, Nyarugunga sector, close to Kigali International Airport, as no other viable alternative sites were considered. The proposed site is ideal as it is in close proximity to other related structures, therefore connecting project components to the existing airport services and facilities such as the runway. In addition, the project blends well with the current land use per Kigali City Masterplan.

The proposed alternative for water supply involves connecting the aircraft hangar to the existing KIA water supply network and nearby WASAC water tank, while the CoE training center is connected to the public water supply system. In addition, rainwater will be collected from the roof and directed into an underground tank after undergoing filtration, to supplement water needs. The design ensures reliable water supply and promotes eco-friendliness.

The proposed alternative for power supply is to connect both the aircraft hangar and CoE aviation training center to the existing KIA substation. Both facilities will have a backup generator to provide emergency power. A separate transformer will be installed at the hangar site to ensure a dedicated power supply and prevent overloading. To enhance energy efficiency and reduce resource exploitation, solar panels will be installed on the roofs of both facilities to supplement the energy needs within the facilities. The proposed option for solar panels will need to undergo a review and evaluation process by both the RCAA and RAC before being approved. An aeronautical study will be conducted to assess the impact of solar panels on aviation activities.

For alternative for construction material, local and sustainable materials will be used for construction to reduce carbon footprint and CO2 emissions. Building materials will be chosen based on factors such as longevity, recyclability, minimal processing, and transportation costs. Designers will consider the full life cycle of the product and aim for disassembly for possible reuse. The use of cement will be reduced.

Alternatives for waste management, solid waste within the aircraft hangar and CoE aviation training centre will be managed by sorting and storing waste in labeled bins for proper segregation. Private associations/cooperatives will transport waste to the municipal dumpsite, and hazardous waste will be disposed of at a designated hazardous disposal site. For liquid waste, mechanical wastewater treatment plants will be built at both facilities to process grey water and allow for non-potable re-use in the project's facilities. During construction, temporary ecosan toilets are proposed to be used.

Stakeholder Engagement

The AfDB OS 1 requirements, emphasize that the borrower or client is responsible for conducting and providing evidence of meaningful consultation (i.e., consultation that is free, prior, and informed) with communities likely to be affected by environmental and social impacts, and with local stakeholders, and also for ensuring broad community support. These requirements were followed in designing the stakeholder engagement undertaken for this ESIA process. Therefore, its implementation, documentation of consultation outcomes and provision of feedback to stakeholders, regarding their concerns/impact issues, are believed to meet all Lender requirements. The methodology employed for Stakeholder Engagement for the ESIA process of the aviation hangar and academy training center project included formal meetings and correspondences.

The stakeholder engagement elaborated information disclosure and consultation activities carried out for this ESIA Report. The project alternatives analysis, the mitigation and enhancement strategies, as well as the recommendations of the ESMP, were all influenced by the issues and concerns gathered. Stakeholder identification process was conducted at an early stage to ensure that stakeholders are consulted early on and that their requirements and expectations for engagement, as well as their goals and objectives regarding the proposed project, are understood.

During the public consultative meetings, key stakeholders identified a number of environmental and social impacts, both positive and negative, that would result from the construction and operation of the Aircraft hangar and CoE aviation training centre project. Employment and business opportunities, increased security, are among the positive impacts identified, while increase in traffic and congestion of the road, stress on sewage system, noise and vibrations, air pollution, and accidents are among the negative impacts that would be generated during the project's operation. All the opinions and concerns expressed were used to assess how the project development can result in a reduction of overall risks by assessing the best alternative and providing adequate mitigation measures.

Following the public consultative meetings with stakeholders, a high-level stakeholder consultation was held with the purpose of allowing stakeholders to comment, give opinions and views to be considered and incorporated in the project design and implementation; build impersonal relation with high level stakeholders; disseminate technical information; and record discussions. Different concerns and opinions were raised and responded to, and care was taken to avoid the omission of any impact issues or concerns. During this consultation, the stakeholders were assured that stakeholder engagement would be a continuous process throughout the project construction and operation phases, so that their concerns and views are taken into consideration.

Positive impacts

The study also assessed the positive impacts of the proposed development and proposed enhancement measures as well as an Environmental and Social Management Plan (ESMP). The positive impacts identified include creation of job opportunities, flow of income-or wealth-enhancing activities, economic development and revenue collection, promotion of gender equality, support to tourism and local business, technological change and innovation, stimulation of foreign investment and international trade, improved infrastructure and status of the area, enhanced maintenance and protection/safety of aircraft, capacity building, improved reputation of the aviation sector, increased availability of skilled labor, locally, regionally and beyond.

Negative impacts

This study identified the potential adverse impacts of the project in terms of the possible effect to the environment and on the interested parties. The baseline data collection was primarily investigated through desktop studies and sites visits, photographic capture and direct interviews with the interested stakeholders.

A summary of issues that arise as of significance for this project's environmental performance along with their mitigation measures are the elaborated below, among others:

Construction phase

Increased runoff and storm water management:

- Ensure harvesting the rain from all buildings and provide appropriate gutters that channel the water into downspouts to the underground tank.
- Installation of retention ponds and sediment traps.

Biodiversity loss:

- Minimize the removal of vegetative cover and carry out revegetation as much as possible.

Air pollution:

- Sprinkling of water during construction to reduce emission of dust.

Soil erosion and compaction:

- Stabilize slopes with appropriate retaining walls or other structures to prevent mudflows or landslides.

Occupational health and safety:

- Ensure moving equipment is outfitted with audible back-up alarms.
- Provide fall protection systems such as guardrails, safety nets, and personal protective equipment to minimize the risk of falls.
- Develop and implement site-specific occupational health and safety (OH&S) Plan.

Noise Pollution:

- Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

Accidental spills, leakage & discharge

- The Contractor should ensure that the employees on site are aware of the company Spill Prevention, Control and Countermeasure (SPCC) Plan for dealing with spills and leaks.

Damage to the utilities in the area:

- Use protective measures such as shoring, fencing, and barriers to protect utilities from excavation and other construction activities. Use vibration monitoring equipment to ensure that nearby utilities are not being damaged by the operation of heavy machinery.

Child Labor and Abuse

- The contractor should ensure that the hired workforce during the construction period is screened and of eligible age to work, in accordance with national labor laws.
- Partnerships should be established with relevant government agencies and NGOs to ensure children access survivor-centered services such as medical care, psychosocial support, legal redress, safety, etc., as, and when necessary.

Both construction and operation phase:**Bird strike hazards:**

- Birds may find the airport the best place to breed, all nesting activities must be discouraged.

Increased runoff and stormwater management:

- Plants and trees will be specified that are native to the local climate, to minimize need for extra irrigation and management.
- The appropriate design and construction of a storm water drainage system will adequately mitigate storm water drainage.
- Control of storm water movement through adequate and correctly constructed storm drains.
- Regular maintenance and inspection of the stormwater management features and ensure that they are functioning properly and effectively managing runoff.

Micro-climate modification:

- All non-constructed areas must not be paved.

Impact on the existing scenery:

- Ensure that the project is designed to blend well with the surrounding buildings.
- Ensure High quality and sensitive design of the proposed site plan.
- Construction of perimeter fence for the entire plot

Electrical and fire hazards:

- Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal.
- Firefighting equipment such as fire extinguishers and sand buckets should be provided at strategic locations to deal with any incident of fire.

Waste generation:

- A Waste Management Plan (WMP) that aligns with the existing KIA plan will be followed for ongoing monitoring and audits.
- Implement sustainable waste management practices, such as reducing waste.
- Generation, recycling, and reusing materials where possible, and properly disposing of hazardous waste.
- Ensure the adequacy of the ecosan toilet facilities during construction, as well as that for the wastewater treatment plants during operations.

Insecurity:

- Ensure strategic installation of security cameras within and around the project facilities to deter criminal activities, detect security breaches, and assist in investigations.

Gender related impacts:

- Every worker should also sign a code of conduct (CoC) as an annex to the employment contract covering issues such as zero tolerance of unacceptable conduct in the community, GBV, sexual harassment, sexual exploitation, and abuse of children.
- Provide separate accommodation facilities and gender sensitive PPE for both women and men, throughout all phases. Provide equal employment opportunities for both genders.

Energy and water consumption:

- Ensure efficient energy consumption where possible and maintained according to the manufacturers' recommendations.
- The developer should adhere to the provisions of the Rwanda Green Building Minimum Compliance System, so as to enhance energy and water efficiency, and enhance indoor air quality.

Operation phase**Storage or handling of hazardous materials:**

- The developer should implement and adhere to the existing KIA hazardous waste management plan.
- Hazardous materials should be stored in appropriately secured, segregated, and labeled containers and areas, to minimize the risk of leaks and spills.

- Regular environmental monitoring can identify potential impacts of hazardous waste storage and handling, including air and water quality monitoring and soil testing.
- Develop spill response plans that include procedures for containing and cleaning up spills, as well as proper disposal of contaminated materials.
- Regular personnel training on the risks and handling techniques associated with hazardous materials should be provided.

Air pollution:

- Implement landing and take-off procedures that minimize air emission impacts by reducing the duration of the landing phase and optimizing climb performance.
- Optimize aircraft movements on the ground in order to reduce taxiing and therefore reduce NOx and SO2 air emissions.

Swimming pool safety:

- Outline the steps necessary to protect the health and safety of those using or operating the pool.

Swimming pool water and chemicals evaporation:

- Install a pool cover and a water-saving pool filter.

Swimming pool water quality:

- Regular monitoring of swimming pool water quality and check if the management meets the swimming pool water quality standards.

Community health and safety:

- Installing noise barriers such as berms, vegetative barriers, or conducting training during non-peak hours can reduce the impact of noise on nearby residents.
- Regular maintenance of aircraft and ground support equipment can minimize the risk of accidents and exposure to hazardous materials.
- Develop and implement an emergency response plan that outlines procedures for responding to accidents and other health and safety issues that may arise and provide adequate training on emergency response procedures.
- The developer is required to conduct a thorough risk assessment to identify possible hazards that may arise from air traffic, accidents, and collisions during training, as well as any other potential accidents that may occur at the hangar site and during training.

Environmental and Social Management Plan

Environmental and Social Management Plan (ESMP) and Environmental and Social Monitoring Plan (ESMoP) were created in the comprehensive Environmental and Social Impact Assessment (ESIA) to assure the successful implementation of proposed mitigation measures, parameter monitoring, and future audits.

Although the majority, if not all, of the areas of concern have been covered in the management measures stated after discussion of the impacts, an Environmental and Social Management Plan (ESMP) has been established as part of the study. Overall, the project is feasible and sound from an environmental standpoint,

with few potential negative impacts that may be totally avoided or at least greatly reduced by implementing the necessary corrective, rehabilitative, restoration and mitigation measures.

These have been integrated into the project decision-making level to ensure the project designs take into consideration all the highlighted aspects of this study. The information presented in this environmental project report where approved, will form the basis for the final design stage of the project.

Roles of implementing agencies in ensuring effective mitigation measures

REMA

As the lead agency responsible for the protection of the environment in Rwanda, Rwanda Environment Management Authority (REMA) will play the leading oversight role in monitoring the activities of the project. The general monitoring will involve site visits, EMP review, and undertaking of annual environment audits. REMA will continue monitoring the project during the use of the Aircraft hangar and CoE aviation training center facilities.

RDB

RDB has the responsibility to establish the conditions of conducting the ESIA, to review and approve the ESIA findings, conclusion, and recommendations through an EIA certificate, once during the Initiation of the Project.

Contractor

The contractor will take on the major responsibility of ensuring that the mitigation measures outlined in the ESMP are carried out in full. The construction contractor will be solely responsible for ensuring that monitoring and adherence to the ESMP beginning from the construction phase up to the point where they install and commission the proposed project facilities. The Engineer will oversee the contractor, make sure the CESMP is implemented every day, and make sure monitoring reports are available and shared on a regular basis.

Proponent (Akagera Aviation Ltd)

The developer will remain committed to the creation and implementation of programs to reduce the probability of the occurrence of deleterious environmental incidents over the course of the project. The responsibilities involve routine monitoring, continuous monitoring and undertaking of reviews of various targets, and provision of finances to implement the EMP.

Conclusion and Recommendations

According to this ESIA study, most of the potential impacts of this proposed project on the environment are of medium to low risks and can be mitigated effectively and easily managed without adverse effects on the surrounding environment. The ESIA study Cost and Benefit Analysis indicates that the benefits far outweigh the associated costs and negative impacts. The socio-economic benefits associated with the project are rated high, it is therefore proposed that the project proponent should be permitted to continue with the project implementation subject to commitments to the mitigation measures proposed and adherence to all necessary approvals from different Authorities.

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ACRONYMS

AfDB:	African Development Bank
AEP:	Airport Emergency Plan
ATL:	Aviation Travel and Logistics
ATCT:	Air Traffic Control Tower
ATPL:	Airline Transport Pilot License
BLS:	Baseline Survey
BRT:	Bus Rapid Transit
CBD:	Convention on Biological Diversity
CEAS:	Centre of Excellence for Aviation Skills
CCTV:	Closed Circuit Television
CO:	Carbon Monoxide
CO2:	Carbon Dioxide
CoE:	Center of Excellence
CPL:	Commercial Pilot License classroom
DDS:	District Development Strategy
EDCL:	Energy Development Corporation Limited
EDPRS:	Economic Development and Poverty Reduction Strategy
EIA:	Environmental Impact Assessment
EICV4:	Fourth Integrated Household Living Conditions Survey
EICV5:	Fifth Integrated Household Living Conditions Survey
ENR:	Environmental and Natural Resources
EPC:	Engineering, Procurement, and Construction
ESF:	Environmental and Social Framework
ESIA:	Environmental and Social Impact Assessment
ESMoP:	Environmental and Social Monitoring Plan
ESMP:	Environmental and Social Management Plan
FAA:	Federal Aviation Administration
FS:	Feasibility Study
GBV:	Gender-Based Violence

GHG:	Greenhouse Gas
GoR:	Government of Rwanda
GPS:	Global Positioning System
GWP:	Global Warming Potential
HIV:	Human Immunodeficiency Virus
HSE:	Health, Safety, and Environment
HSSP:	Health Sector Strategic Plan
HSSP4:	Fourth Health Sector Strategic Plan
IATA:	International Air Transport Association
ICT:	Information and Communication Technology
ICAO:	International Civil Aviation Organization
ISS:	Integrated Safeguards System
KIA:	Kigali International Airport
kWh:	Kilowatt Hour
LED:	Light-Emitting Diode
LPG:	Liquefied Petroleum Gas
LOTO:	Lockout/Tagout
MEP:	Mechanical, Electrical, and Plumbing
MINALOC:	Ministry of Local Government
MININFRA:	Ministry of Infrastructure
MIGEPROF:	Ministry of Gender and Family Promotion
NBS:	Nature-Based Solutions
NCDs:	Non-Communicable Diseases
NDCs:	Nationally Determined Contributions
NISR:	National Institute of Statistics of Rwanda
NO2:	Nitrogen Dioxide
NST:	National Strategy for Transformation
ODP:	Ozone Depletion Potential
OH&S:	Occupational Health and Safety
PPE:	Personal Protective Equipment

PAI:	Project Area of Influence
PM10:	Particulate Matter with a diameter of 10 micrometers or less
PM2.5:	Particulate Matter with a diameter of 2.5 micrometers or less
PPL:	Private Pilot License classroom
RAPEP:	Rwanda Association of Professional Environmental Practitioners
RCAA:	Rwanda Civil Aviation Authority
REMCO:	Rwanda Engineering and Manufacturing Corporation
REP:	Rwanda Energy Policy
RDB:	Rwanda Development Board
RDF:	Rwanda Defense Force
RHA:	Rwanda Housing Authority
RMCS:	Regional Member Countries
RPM:	Respirable Particulate Matter
RSB:	Rwanda Standards Board
RURA:	Rwanda Utilities Regulatory Authority
RWIPO:	Rwanda Water Resources Board
SARPs:	Standards and Recommended Practices
SEA:	Sexual Exploitation and Abuse
SEP:	Stakeholder Engagement Plan
SPM:	Suspended Particulate Matter
SO2:	Sulfur Dioxide
SPCC:	Spill Prevention, Control, and Countermeasure
STP:	Sewage Treatment Plant
STP:	Standard Temperature and Pressure
UAW:	United Auto Workers
UNFCCC:	United Nations Framework Convention on Climate Change
UPC:	Urban Planning Code
UHC:	Universal Health Coverage
USD:	United States Dollar
VHF:	Very High Frequency

VOC: Volatile Organic Compounds
VVVF: Variable Voltage and Variable Frequency
WASAC: Water and Sanitation Corporation
WHO: World Health Organization

1.0 INTRODUCTION

1.1 Background and Overview of the Project

The Government of Rwanda considers the transportation sector to be a significant driver of economic growth. To attract both domestic and foreign investment in the country, it recognizes the importance of enhancing the quality and dependability of transport services while reducing costs. To this end, the government has implemented a comprehensive investment plan and capacity building program that includes expanding Kigali International Airport and other domestic airports, establishing a Center of Excellence in aviation training, providing navigational services, constructing a new international airport, and supporting the growth of the national carrier, RwandAir.

It is in this context that the developer Akagera Aviation Limited intends to construct an Aircraft hangar capable of accommodating 8 Beechcraft King Air size aircraft at the Kigali International Airport. Additionally, they propose the creation of a CoE aviation training center to serve up to 490 students and training staff. The CoE will offer different aviation training/courses such as Pilot training, Maintenance training, Cabin crew, Dispatch, Ancillary courses, Air Traffic Management Courses, Aeronautical information services, Aeronautical meteorological services, Aeronautical communications operations, Communication Navigation and Surveillance, Airport Emergency Services (Operations), and other supporting programs. The academy will partner with higher learning institutions to provide academic aviation courses.

Given the increasing importance of Unmanned Aircraft Systems (UAS) applications in Rwanda, the CoE will also provide drone piloting training along with other manned aircraft pilot training courses such as, Private Pilot License classroom (PPL), Commercial Pilot License (CPL) training, Airline Transport Pilot License (ATPL), Flight Simulator Recurrent training and other advanced pilot training for specialized missions.

1.2 Project Objectives

The Rwandan air transport is experiencing rapid growth, the air transport industry is a vital engine of global socio-economic growth. It is of vital importance for economic development, creating direct and indirect employment, supporting tourism and local businesses, and stimulating foreign investment and international trade. Economic growth, technological change, market liberalization, the growth of low-cost carriers, airport congestion, oil prices and other trends affect commercial aviation throughout the world. The Rwanda air transport industry's mission is to become a Centre of Excellence in aviation in Africa and to spearhead aviation industry development in East Africa and Central Africa and Globally.

The objective of the CoE aviation training centre is to empower the labor force in the aviation industry by providing qualifications in the aviation field not only in Rwanda but also in the region and beyond. To achieve that, the client has initiated the project of training together with administrative facilities for the aviation academy without forgetting the need for conferences, libraries, recreation, and accommodation.

The proposed CoE aviation training center is composed of different department:

- Pilot training
- Maintenance training, Cabin crew, Dispatch, Ancillary courses
- Air Traffic Management Courses
- Aeronautical information services
- Aeronautical meteorological services
- Aeronautical communications operations

- Communication Navigation and Surveillance
- Airport Emergency Services (Operations) and other supporting programs

The objective for the aircraft hangar is to provide shelter for fixed wings and rotary wing aircraft, maintenance/engineering and other technical aircraft activities.

1.3 Project Financier

The proposed Aircraft hangar and CoE aviation training centre project will be financed by the African Development Bank (AfDB).

The main goal of the African Development Bank (AfDB) Group is to promote sustainable economic growth and social progress in its regional member countries (RMCs) and contribute to poverty reduction. The AfDB achieves this objective by providing financial resources for investment in RMCs and offering policy advice and technical assistance to support development efforts.

The AfDB has been a significant contributor to Rwanda's development since its inception in 1974, investing a total of US\$2.9 billion in various development projects. Most of the funding has been allocated to infrastructure-related projects, and the AfDB is the second-largest development partner of Rwanda after the World Bank. The AfDB's current portfolio consists of 26 projects worth US\$1.5 billion, with a focus on infrastructure, such as water, sanitation, transport, and energy. The remaining projects aim to develop human capital and support the private sector's growth to contribute to Rwanda's socio-economic transformation.

As Rwanda invests in the construction of its international airport in Bugesera and its airplane fleet, skilled personnel are required to manage, operate, and maintain these investments. Therefore, the AfDB will assist the government in establishing the Centre of Excellence for Aviation Skills (CEAS), which will serve as an aviation academy training center to meet the demand for qualified human capital. The AfDB's financial support for the project is a testament to their commitment to promoting sustainable economic development and social progress in the region by investing in critical infrastructure and human capital development.

1.4 Project Cost

The project's total cost amounts to \$53.5 million USD, divided into infrastructure and equipment expenses of \$29.1 million USD and \$24.4 million USD, respectively. Phase 1 is projected to consume \$27,890,240.25 USD, comprising \$18,390,240.25 USD for infrastructure and \$9,500,000.00 USD for equipment. In Phase 2, an estimated total of \$25,344,519.42 USD will be spent, with \$10,444,519.42 USD allocated for infrastructure and \$14,900,000.00 USD for equipment.

1.5 ESIA Objectives

The proposed project must undergo an Environmental and Social Impact Assessment (ESIA) that complies with international standards as part of the decision-making process by the African Development Bank (AfDB), from which the financing is sought.

The main objectives of this ESIA are to predict any significant impacts of the proposed Aircraft hangar and CoE aviation training centre project development on the environment and, where applicable, propose measures to avoid, reduce or remedy them. It reports on the findings of the ESIA process to date and informs the developer, Akagera Aviation Ltd and other interested parties, and the public in general about the likely effects of the project on the environment.

In doing this, the ESIA has been prepared in compliance with the national EIA guidelines and the AfDB Integrated Safeguards System (ISS). Section 2 provides details of the Directive as well as the national legislation that has been followed and the guidelines that have been considered.

This ESIA follows a grouped format structure. Using this structure, the ESIA examines each environmental topic in a separate section. These sections generally cover:

- The legal, policy and institutional framework.
- The proposed development.
- The receiving environment.
- Project alternatives
- Likely project significant impacts and mitigation measures.
- Environmental and Social Management Plan (ESMP); and
- Stakeholder Engagement Plan (SEP)

According to the AfDB Operational Safeguards, the draft of the ESIA must be made publicly available to project stakeholders. During the creation of the final ESIA, feedback from stakeholders and the public was considered, and this will continue to be done during the final decision-making process by the funders.

The ESIA assesses the interactions between issues in different sections and proposes mitigation measures to reduce adverse effects. These measures are important and enforceable commitments that guide the project's development and management. To facilitate understanding during the Environmental Impact Assessment process by consenting authorities, it is helpful to have an overview of all the proposed mitigation measures in the ESIA.

1.6 ESIA Methodology

1.6.1 Screening

For the screening exercise, meetings were held with the project team and looked over the available documentation. The expectations for this evaluation in terms of the task scope and the technique to be used for the same were also discussed. A desk-based review of project documentation and other relevant materials was conducted to gain a comprehensive understanding of the project and its potential impacts. In addition, secondary data on the project area, district, and state was studied to support the primary data.

1.6.2 Scoping

During this phase, the consultant collaborated with the client and relevant stakeholders identified through the Stakeholder Identification Process. The consultant scoped the study by determining the geographic coverage, stakeholders, significant impacts, and level of detail required for each impact study. Additionally, the scoping exercise involved a review of literature and field visits to identify the spatial dimensions and data on the project's zones of influence while eliminating insignificant impacts.

The approach used to identify the project's potentially significant impacts included:

- Consultation with and feedback from the public, private sector, and governmental institutions.
- Expertise in aviation infrastructure development and operation, as well as the potential effects.
- Basic familiarity with the current environment and sensitive areas.

This exercise was also used to adequately prepare tools and techniques to be used in the data collection.

1.6.3 Description of the project

A detailed description of the project was then done at the next stage to outline the features and activities of the project, based on information provided by the developer. Based on the project design and existing environment, an assessment of best available alternatives was made and compared the alternatives from the point of view of their environmental and social impact, their investment and operating costs, their compatibility with local conditions and in relation to institutional and training needs.

1.6.4 Baseline data collection

The consultant proceeded to assess the environmental context and baseline data within which the project is to be set. For the Aircraft hangar and CoE aviation training centre project, desk research and on-site inspections were used to acquire baseline data. Desk studies utilised information from already-existing sources, including data from reports, the internet, and data supplied by the project proponent. Site visits were conducted to enhance and validate the data from desk research.

The study area was defined initially by the proposed locations of the Aviation hangar and academy training centre, and then by the area that could be affected by construction and operation of the project components. Parameters that were examined included the following:

1.6.4.1 Physical environment

Site location; geology; topography; soils; climate; wind characteristics; air and noise quality; surface and ground water hydrology; land cover.

1.6.4.2 Biological environment

Biological environment includes the fauna and the flora that can be impacted by the project activities, as well as critical habitats and sensitive eco-systems.

1.6.4.3 Socio-cultural environment

The socioeconomic analysis consisted of two main aspects, which may be loosely categorized as Rapid Appraisal Work (RAW) and a Baseline Survey (BLS). The RAW included visits, interviews with interested parties, discussions with stakeholders, site visits and inspection to the area. As such, the BLS sought to determine socioeconomic characteristics, land use, and perceptions of the potential impacts that may arise from the implementation of the project.

1.6.5 Impact identification

For impact identification, a checklist was employed to identify possible impacts from the project development and the matrix to determine the significance of each identified impact. Expert opinion was vital to interpret the acquired information. The identified impacts were allocated mitigation measures.

1.6.6 Environmental and Social Management Plan (ESMP)

The ESIA report serves as the foundation for the Environmental and Social Management Plan (ESMP) for the project. The ESMP contains measures to manage the project's environmental and social impacts in the short and long term during all phases of the project. These measures include mitigating actions and monitoring indicators, which are presented in an organized tabular format that outlines clear roles and responsibilities for their implementation and oversight.

1.6.7 Stakeholder Engagement

During the ESIA process, the consultant and Akagera Aviation Ltd identified and analyzed stakeholders who could be affected by or could influence the proposed project activities. The stakeholders identified were diverse and included government ministries and agencies, local authorities, environment committees, and experts, among others.

By involving these stakeholders early in the ESIA process, the developer and consultant gathered their opinions, concerns, and views, which helped to inform the assessment, identify potential impacts of the proposed project, and identify opportunities to mitigate any negative effects.

A Stakeholder Engagement Plan is included in this ESIA report, outlining how the stakeholder engagement was carried out during the ESIA process, and how it will continue to be carried out during project implementation. The stakeholder engagement process aimed to build support for the project and create a more transparent and inclusive decision-making process.

2.0 POLICY, LEGAL, AND INSTITUTIONAL FRAMEWORK

2.1 Introduction

This section of the ESIA Report details the Policy, Legal and Institutional Framework for the proposed Aircraft hangar and CoE aviation training centre project, covering the national policies, and legislations that are relevant to this project as well as applicable international treaties and conventions. International legislation such as AfDB Operational Safeguards was considered in this report. Therefore, this section's goal is to outline all the proposed project's regulatory and non-regulatory performance requirements.

Rwanda has adopted environmental legislation, including environmental impact assessment procedures. According to the National Environment and Climate Change Policy issued in 2019, Environmental Impact Assessments must be carried out prior to development of infrastructure projects. REMA was set up to implement this policy.

In April 2005, Rwanda adopted a legal framework in accordance with its National Policy on Environment, the Environmental Organic Law of 2005 was later amended to the Environmental Law No 48/2018 of 13/08/2018 determining the modalities of protection, conservation, and promotion of environment in Rwanda. Article 46 states that any person who does not carry out environmental impact assessment before launching any project that may have harmful effects on the environment while it is required, is punished by suspension of his/her activities or closure of his/her association, and ordered to rehabilitate the damage to environment, persons, and property. He/she will also pay an administrative fine of two percent (2%) of the total cost of the project. Ministerial Order No 001/2019 of 15/04/2019 of the Minister having environment in his or her attributions determines the list of projects mentioned in this organic law".

This section is therefore intended as a guide to the relevant permitting requirements that deal with the environmental impacts of this proposed development and the agencies to which they relate as well as presents other legislation and regulations, which are applicable to the development. The ESIA must be submitted to the Rwanda Development Board (RDB). The Environmental Unit within RDB provides advice on ESIA and ensures compliance as part of the investor facilitation.

The Aircraft hangar and CoE aviation training centre project will ensure that project activities are carried out in accordance with the policies and laws mentioned below, as well as in the context of the existing institutional framework, determining the responsibilities of each institution.

2.2 National Legislation

Several national laws, plans, and policies offer a framework for Rwanda's goals and aspirations as well as guiding principles for this project. These are as discussed below.

2.2.1 Policy Framework

2.2.1.1 The Rwanda Development Vision, 2050¹

Vision 2050 serves as the critical planning and policy blueprint to guide the efforts of all players in Rwanda's development, including government, private sector, citizens, diaspora, civil society and faith-based

1

https://www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/REPORTS/National_Development_Planning_and_Research/Vision_2050/English-Vision_2050_Abridged_version_WEB_Final.pdf

organizations, development partners, academia and research institutions, and political parties. It aspires to take Rwanda to upper middle-income country status by 2035 and high-income status by 2050.

Rwanda's Vision 2050 articulates the long-term strategic direction for "the Rwanda we want" and the enabling pathways to achieve this ambition. Energized by – but by no means content with – the past two decades of success in reducing poverty, increasing incomes, improving living standards, strengthening good governance, promoting home grown solutions, establishing rule of law, maintaining stability, promoting gender equality and women empowerment, peace, and security. Rwanda now aspires to transform its economy and modernize the lives of all Rwandans.

The next phase of Rwanda's long-term development is focused on transformation of the entire economy and society. There is a need to continue the journey towards self-reliance through a private sector led growth and transformation economic model. In the next 3 decades, the country will make long-term investments in future endowments: enhanced human capabilities, strong innovation and technological capabilities, socioeconomically integrated forms of urbanization, and effective and accountable institutions of governance.

Rwanda has recognized air transport as the key enabler of its development and a vehicle to position itself to become a regional service, tourism, and conference hub. To achieve economic and social development as part of its Vision 2050, Rwanda has invested heavily in its national carrier, airport infrastructure and capacity building to connect the country to markets overseas, ensure access for business professionals and investors, and create employment.

Alignment

- The proposed project will achieve the pillar of human development with Akagera aviation Ltd providing a high-quality education and a transformed workforce for higher productivity.
- The proposed project will attract and sustain high private investment, promote higher public investment as well as improve human capital through education.
- The implementation of the proposed project complies with Vision 2050 and will aid in upskilling previously unskilled labor.

2.2.1.2 National Strategy for Transformation, (NST-1, 2017-2024)²

The National Strategy for Transformation has among other outcomes, the "increased access to basic infrastructure (water, sanitation, electricity, ICT, Shelter) achieved". It is an amalgamation of the Economic Development and Poverty Reduction Strategy (EDPRS) and 7 Year Government Program. It intends to spur national development towards economic growth, capacity development and combating HIV/AIDS and non-communicable diseases, disability and social inclusion, gender and family promotion, regional integration and international positioning, environment and climate change, disaster management and improving the well-being of its citizens.

Priority sectors include energy, agriculture; private sector development; environment and natural resources; urbanization; transport; tourism; manufacturing and ICT. NST-1 emphasizes on interventions geared to promote access to finance for women, mainstreaming gender in employment and job creation strategies, capacity development of the gender machinery.

² https://www.nirda.gov.rw/uploads/tx_dce/National_Strategy_For_Transformation_-NST1-min.pdf

The growth of the aviation sector in Rwanda helps achieve the priorities of the NST 1 such as the economic transformation and the social transformation where it is helping increase investment in the country hence contributing to the transformation of Rwanda.

Alignment

- The proposed project will contribute to the social transformation since it will create employment either in the operational and construction phase.
- As part of its development, the proposed initiative aims to increase women's participation and empowerment as a contribution to national transformation.
- The proposed project will help boost investments in the sector, achieving significant increases in land efficiency and innovative capacity.

2.2.1.3 National Environment and Climate Change Policy, 2019³

The Government of Rwanda, through the Ministry of Environment, has introduced an Environment and Climate Change Policy to better prepare the country for new opportunities and challenges related to the management of our natural environment and the climate crisis. In addition, the new policy will support Rwanda to put environment and climate change at the heart of decision making across the public and private sectors as well as civil society by including these topics in *Imihigo* (government performance contracts), *Itorero* (civil service) and general school and university curricula.

Rwanda while sustaining what has been achieved and addressing environment and climate change issues remain a challenge. The key environmental and climate change issues in Rwanda include land degradation, deforestation, dependency on biomass for fuel, soil, water and air pollution, a lack of environment-friendly transport systems, vulnerability of natural ecosystems, lack of low-carbon materials for housing and green infrastructure development, inadequate waste treatment for both solid and liquid waste, increase of electronic, industrial and nuclear/radioactive wastes, limited coordination in environmental and climate change governance, among others. More efforts are also needed to develop comprehensive tools to support implementation, mainstreaming and increasing ownership in all sectors and developing key infrastructure such as waste resource management, among others, and positioning Rwanda to tap into opportunities of international climate finance.

The policy will ensure Rwanda has a clean and healthy environment that is resilient to climate variability and supports a high quality of life for its society. The implementation of the policy will be guided by the spirit of inclusiveness, economic and ecosystem value, adaptation, promotion of circular economy, and cooperation.

The main policy objectives are:

- Greening economic transformation.
- Enhancing functional natural ecosystems and managing biosafety.
- Strengthening meteorological and early warning services.
- Promote climate change adaptation, mitigation, and response.
- Improve environmental well-being for Rwandans.
- Strengthen environment and climate change governance.
- Promoting green foreign and domestic direct investment and other capital inflows.

³<http://www.fonerwa.org/sites/default/files/2021-06/Rwanda%20National%20Environment%20and%20Climate%20Change%20Policy%202019.pdf>

This Environment and Climate Change Policy reaffirms our commitment to address climate change and our resolve to lessen the potential hardships that climate change may pose to the sustainable development of our country. The policy, therefore, seeks to provide strategic direction on environment and climate change in Rwanda, bearing in mind its linkages with our socio-economic development. Rwanda will continue to mainstream the environment and climate-proofing agenda into national development. This brings to the fore the reality of mutually reinforcing and integrating the environment and climate change issues into the national, local planning and budgeting processes.

Alignment

- The implementation of the proposed project will ensure the use of low-carbon materials in construction, as well as promote waste management practices to reduce greenhouse gas emissions.
- The project will contribute to reducing gas emissions and adapt to climate change impacts with linkage to socioeconomic development.
- The proposed project's promotion of energy efficiency through the incorporation of solar energy, LED lighting, and motion sensors aligns with the policy by prioritizing the adoption of renewable energy and energy-efficient technologies to mitigate climate change and promote sustainable development.

2.2.1.4 Health sector policy, 2015⁴

The Health Sector Policy is the basis of national health planning and the first point of reference for all actors working in the health sector. The overall aim of this policy is to ensure universal accessibility (in geographical and financial terms) of equitable and affordable quality health services (preventative, curative, rehabilitative and promotional services) for all Rwandans. It sets the health sector's objectives, identifies the priority health interventions for meeting these objectives, outlines the role of each level in the health system, and provides guidelines for improved planning and evaluation of activities in the health sector.

A companion Health Sector Strategic Plan (HSSP) elaborates the strategic directions defined in the Health Sector Policy to support and achieve the implementation of the policy, and more detailed annual operational plans describe the activities under each strategy.

Rwanda's fourth health sector strategic plan (HSSP4) is meant to provide the health sector with a Strategic Plan that will highlight its commitments and priorities for the coming 6 years. It will be fully integrated in the overall economic development plan of the Government. HSSP4 will fulfil the country's commitment expressed in the national constitution, National Strategy for Transformation (NST) and the aspirations of the Health Sector Policy 2015⁵. The strategies herein adhere to the Universal Health Coverage (UHC) principles towards realization of the Sustainable Development Goals (SDGs). HSSP4 therefore lays a foundation for Vision 2050 ("The Rwanda We Want"), which will transform Rwanda into a high-income country by 2050. HSSP4 anticipates the epidemiological transition of the country, the increase in population and life expectancy and the expected increase of the health needs of the elderly, notably in Non-Communicable Diseases (NCDs). HSSP4 also anticipates a decrease in external financial inflows, hence it is imperative to build secure / resilient health systems.

⁴ <https://faolex.fao.org/docs/pdf/rwa206567.pdf>

⁵ <https://www.moh.gov.rw/index.php?eID=dumpFile&t=f&f=6008&token=13b8e7fdbacffe4356c60868b07047e62027f158>

The overall objective of the health sector is to ensure universal accessibility (in geographical and financial terms) of equitable and affordable quality health services (preventative, curative, rehabilitative and promotional services) for all Rwandans.

Alignment

- The proposed project will have first aid rooms that will be equipped with the necessary equipment to deal with health problems that may result from accidents and hazards.
- By maintaining health safety on the project sites and implementing awareness programs on HIV, AIDS, child abuse, SH, Malaria, etc., the implementation of the proposed project will be aligning with this policy throughout all project stages.

2.2.1.5 Green Growth and Climate Resilience National Strategy for Climate Change and Low Carbon Development, GGCRS 2011⁶

The strategy was the first attempt at plotting a climate resilient and low carbon development pathway for Rwanda. The vision 2050 envisages Rwanda as a climate-resilient country and a low-carbon economy, guided by: economic growth and poverty reduction; good regional and global citizenship sustainability of the environment and natural resources; gender equality and equity; and welfare and wellness of all citizens in a growing population. Fourteen programs of action focus on diversifying energy sources with low-carbon energy grid and promoting green technology and resource-efficient industries throughout all production.

The strategic objectives include: (1) To achieve energy security and low-carbon energy supply that supports the development of green industry and services, (2) Achieving sustainable land use and water resource management that results in food security, appropriate urban development and preservation of biodiversity and ecosystem services, (3) Achieving social protection, improved health and disaster risk reduction that reduces vulnerability to climate change. Among the programs of action of the strategy, is green industry and private sector development, climate compatible mining, efficient resilient transport systems, and low carbon urban systems.

Alignment

- The proposed project will incorporate energy and water efficiency measures and prioritize waste recycling in its design to uphold a low carbon system.
- Renewable energy sources will be used for electricity consumption in the proposed project, resulting in reduced emissions.
- The construction of new facilities will involve the use of sustainable building materials and green building design to minimize their environmental impact.

2.2.1.6 National Energy policy, 2015⁷

Energy Policy has been developed to guide and influence decisions on the extraction, development, and use of Rwanda's energy resources in a transparent and sustainable manner. The vision of the energy sector is to contribute effectively to the growth of the national economy and thereby improve the standard of living

⁶https://www.rema.gov.rw/rema_doc/RGG&CRS%202011/Rwanda%20Green%20Growth%20Strategy%20FINAL%20high%20res.pdf

⁷ https://rura.rw/fileadmin/Documents/Energy/RegulationsGuidelines/Rwanda_Energy_Policy.pdf

for the entire nation in a sustainable and environmentally sound manner. In addressing both demand and supply side issues across all key sub- sectors, this policy will contribute to realizing the vision.

The Rwanda Energy Policy (REP, 2015) highlights measures that need to be undertaken to promote energy efficiency through a combination of approaches such as regulations, new codes and standards, introduction of economic incentives such as subsidies for installation of solar water heaters, industrial end-users undertaking energy efficiency audits, barrier removal programmes such as examining systemic disincentives or reducing split incentives for energy-efficient technologies in buildings and pursuit of bulk procurement strategies such as the importation of light-emitting diode (LED) lamps.

The overall goal of the policy is to ensure that all residents and industries can access energy products and services that are sufficient, reliable, affordable, and sustainable.

Specific core global objectives of the energy policy include:

- Ensuring the availability of sufficient, reliable, and affordable energy supplies for all Rwandans.
- Creating an enabling environment for increased private sector participation in energy supply and service provision.
- Encouraging and incentivizing more rational, efficient use of energy in public institutions, and amongst industrial and household end-users.
- Ensuring the sustainability of energy exploration, extraction, supply, and consumption to prevent damage to the environment and habitats.
- Promoting safe, efficient, and competitive production, procurement, transportation, and distribution of energy.
- Developing the requisite institutional, organizational, and human capacity to increase accountability, transparency, national ownership, and decentralized implementation capacity for sustainable energy service delivery.

The Energy Policy and the Energy Sector Strategic Plan (ESSP) outlines targets and an implementation framework against which to measure progress towards the realization of the policy. In this way, the policy can guide implementation strategies, while the ESSP outlines the priority strategies and actions that give practical thrust to the policy. It recognizes the need to shift consumption from biomass-based energies to clean energies like electricity and Liquefied Petroleum Gas (LPG) to reduce pressure on forest resources. It also focuses on renewable energy infrastructure as one strategy to fight global warming through reductions in greenhouse gas emissions.

Alignment

- The use of solar energy in the project aligns with the policy's goal of increasing the share of renewable energy sources in the country's energy mix.
- The incorporation of motion sensors, LED lighting, and cross ventilation in the project's design promotes energy efficiency, which is one of the key objectives of the Rwanda Energy Policy.
- The use of natural lighting in the project's design promotes the efficient use of energy and aligns with the policy's objective of promoting green buildings.
- The implementation of sustainable features in the project's design reduces greenhouse gas emissions, which aligns with the Rwanda Energy Policy's goal of mitigating climate change.

2.2.1.7 Nationally Determined Contributions, 2020⁸

As a Party to the United Nations Framework Convention on Climate Change (UNFCCC), Rwanda seeks to contribute to the ambitious goal of limiting temperature rise to 2°C with efforts to reach 1.5°C agreed under the Paris Agreement. Therefore, Rwanda's enhanced NDC document presents the Government of Rwanda's update of its first Nationally Determined Contributions (NDCs) for mitigation and adaptation for the period to 2030.

The updated NDC sets out Rwanda's bold commitment to reduce GHG emissions by 38 percent and includes adaptation measures in priority sectors, including water, agriculture, land, forestry, human settlement, transport, health, and mining.

Rwanda's mitigation contribution takes the form of a reduction in GHG emissions relative to a business-as-usual (BAU) emissions baseline over the period 2015-2030. A detailed assessment of identified GHG mitigation options for Rwanda estimates a total emissions reduction potential of around 4.6 million tCO₂ e in 2030 against the BAU emissions in the same year of 12.1 million tCO₂ e. Based on this analysis, mitigation measures have been grouped according to two different components:

- **Unconditional contribution:** A reduction of 16 per cent relative to BAU in the year 2030; equivalent to an estimated mitigation level of 1.9 million tons of carbon dioxide equivalent (tCO₂ e) in that year. This is an unconditional target, based on domestically supported and implemented mitigation measures and policies.
- **Conditional contribution:** An additional reduction of 22 per cent relative to BAU in the year 2030; equivalent to an estimated mitigation level of 2.7 million tCO₂ e in that year. This represents an additional targeted contribution, based on the provision of international support and funding.

As like many other countries, Rwanda is increasingly experiencing the impacts of climate change. Rainfall has become increasingly intense, and the variability is predicted to increase by 5% to 10% (GoR, 2018a). Changes in temperature and precipitation and their distributions are the key drivers of climate and weather-related disasters that negatively affect Rwandans and the country's economy, including through droughts, floods, and landslides which results in damage to infrastructure, loss of lives and property (including crops) and contribute to soil erosion and water pollution. Rwanda is highly reliant on rain-fed agriculture both for rural livelihoods and exports of tea and coffee, in addition to depending on hydropower for half of its electricity generation. The country's ongoing economic growth is therefore highly threatened by climate change.

Alignment

- The proposed project must be in accordance with the national policy strategies and the international agreements on climate change (e.g., GGCRS, NDC, etc.)
- The proposed project will play a significant role in helping to offset carbon emissions by utilizing low-carbon solutions.
- The use of solar energy in the project reduces reliance on fossil fuels and aligns with Rwanda's commitment to increasing the share of renewable energy sources in its energy mix as outlined in its NDCs.
- The incorporation of motion sensors, LED lighting, and cross ventilation in the project's design promotes energy efficiency, which is a key objective of Rwanda's NDCs.

⁸ https://unfccc.int/sites/default/files/NDC/2022-06/Rwanda_Updated_NDC_May_2020.pdf

- The use of natural lighting in the project's design promotes the efficient use of energy and aligns with Rwanda's NDCs, which include a commitment to promoting the adoption of green buildings.
- The implementation of sustainable features in the project's design reduces greenhouse gas emissions, which aligns with Rwanda's NDCs, which include a commitment to reducing emissions by 38% by 2030 compared to business-as-usual scenarios.

2.2.1.8 Rwanda Biodiversity policy, 2011⁹

Rwanda's biodiversity resources are a valuable natural endowment that offers a wide range of benefits and opportunities for local and national economic development, improved livelihoods and provision of environmental goods and services such as biodiversity and watershed protection. The challenge before Rwanda is to sustainably manage its biodiversity for present and future generations, by better balancing human needs with those of the environment. Meeting this challenge will require fundamentally new strategies and approaches for valuing and managing biodiversity goods and services.

The policy provides an overarching framework for the conservation, sustainable utilization, access to biodiversity resources and fair equitable sharing of benefits derived from the resources. This fits in the vision of Rwanda to be a prosperous nation, whose people live and work in harmony with the natural environment, and which derives lasting benefits from the conservation and sustainable use of its rich biological diversity. It considers the rehabilitation of degraded ecosystems in Rwanda as an urgent and major task that requires the commitment of significant resources from both national budgets and other sources.

This policy partly articulates Rwanda's policy options and strategies towards the implementation of the CBD and other international agreements as well as linking national biodiversity management with regional, sub-regional and bilateral initiatives.

The objectives of this policy are to:

- Provide a comprehensive and cohesive policy framework that will strengthen the Government's ability to conserve and protect Rwanda's natural and cultural resources.
- Provide a legal and institutional framework for biodiversity conservation and management throughout the country.
- Promote partnerships, incentives and benefit sharing to enhance biodiversity conservation and management.
- Promote generation, management of conservation knowledge, including traditional knowledge, and its application in the conservation of biodiversity.
- Provide a framework for access to genetic resources and the sharing of benefits derived from those resources.
- Promote positive attitudes towards biodiversity conservation and management.

The Biodiversity Policy provides the framework for developing strategies, plans and programs for implementing the environmental targets set out in the National Strategy for Transformation – NST1. Rwanda has ratified the Convention on Biodiversity and has the obligations related to establishing a system of protected areas, rehabilitating, and restoring degraded ecosystems and promoting the recovery of threatened species; Identifying and controlling all potential sources of adverse impacts on biodiversity and carrying out environmental impact assessments on projects likely to have "significant adverse effects" on biological diversity.

Alignment

⁹ https://rema.gov.rw/rema_doc/pab/RWANDA%20BIODIVERSITY%20POLICY.pdf

- This policy's objective of preserving Rwanda's biological diversity will be clearly aligned, with the design and execution of the proposed project in an environmentally sound and sustainable manner.
- This policy shall apply not only to construction at the project site but also its surroundings and affiliated areas such as preserving soil health, revegetating cleared areas, restoration of borrow pits for stabilized soils and mined quarries for construction material.
- The proposed project developers will make sure that there is preservation of land by clearing less land as possible and planting different tree species especially the protected plant species that may be unplanted during construction.

2.2.1.9 National Policy on HIV/AIDS, 2003¹⁰

The National Policy against HIV and AIDS is an essential tool that provides the government orientation in the fight against the spread of HIV&AIDS, reducing its impact on the Rwandan community and setting up appropriate coordination mechanisms. The mission of the policy is to create an environment that favors a coherent, systematic, and efficient national response to HIV&AIDS. It is an expression of the GOR's commitment through strategies to reduce risk, impact, and vulnerability on the citizens of the country. This expression of commitment is proof of the GOR's determination to preserve the Rwanda population, resident foreigners, and visitors to Rwanda from HIV/AIDS. This has resulted in developing and implementing the National Rwanda Policy and the National Strategic Plan against HIV/ AIDS, to which the GOR is strongly committed.

The policy's objective is to give orientations for implementing the national strategic plan that is structured upon the following axes: 1) Reinforce measures of prevention of HIV&AIDS transmission. 2) Assure that the national response to HIV&AIDS is adapted to Rwanda's evolving socio-economic and health conditions by using surveillance and research result. 3) Improve HIV&AIDS-related treatment for persons infected and affected by HIV&AIDS. 4) Reduce the detrimental effects of HIV&AIDS on Rwanda's(micro/macro) socio economic conditions. 5) Coordinate the multisectoral response to increasing cost-effectiveness.

Alignment

- Since the proposed project will involve communities and construction activities that will provide potential job opportunities, resulting in an influx of people to the area and promoting interactions between people and communities, the policy will be taken into consideration during the ESIA process and mitigation/management measures will be developed to promote the above-mentioned objectives of the policy.
- The developer and contractor will organize training sessions for their employees on HIV/AIDS awareness, prevention, and care. This training can include information on how HIV is transmitted, the importance of testing, the prevention methods, and the availability of treatment.
- The developer and contractor can promote non-discrimination against employees and customers who are living with HIV/AIDS. This can be done by creating a workplace that is free from discrimination and stigma, providing reasonable accommodations for employees living with HIV/AIDS, and promoting equal treatment of all customers.

¹⁰https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---ilo_aids/documents/legaldocument/wcms_127582.pdf

2.2.1.10 Land Policy, 2019¹¹

From the perspective of the National Strategy for Transformation (NST-1), the overall objective of the national land policy is to strengthen land administration and management to ensure optimal allocation and use of land. Specifically, the policy shall address existing gaps or deficiencies in land use planning and mapping, land utilization by various sectors, and land administration and management. This policy is backed by a general understanding that land will remain a fixed and a very critical asset, its use requires therefore more innovative economic options to ensure efficient land use and management in support of various development programs across the sectors without compromising the benefits of the future. It puts emphasis on appropriate land administration systems as a key element of land tenure security by providing the possibility of registering and transferring land and the possibility of investment in land. The policy is further expected to:

- Guide, develop, and monitor the implementation of land use plans.
- Ensure effective and efficient land utilization and management across various sectors such as agriculture, industry, forestry, livestock, human settlement, mining, and other public investment.
- Support investment promotion through the allocation of land for strategic investment.
- Strengthen the current land administration system for enhanced land-based service delivery.
- Strengthen mechanisms for the effective administration of land fees and real property taxes (e.g. proper and up-to-date land records, maximization of real property tax and lease fees collection, and capacitate decentralized administrative entities in tax administration).
- Enforce land sub-sector coordination to ensure an integrated approach for efficient cross-sectorial land utilization and collaboration towards sustainable land use and management.

The economic implication of this land policy is seen at three levels. Firstly, the proposed efficient land use management is expected to increase productivity across economic sectors that depend on land use management systems such as agriculture, industry, forestry, mining, tourism, housing and urbanization, use of some buffer zones and protected areas for environment-friendly economic activities, etc. Secondly, by allocating specific land for strategic investments, this policy opens a window for Rwanda to boost its economic investments. Thirdly, it is also anticipated that effective tax administration will increase tax revenues that in turn will support public spending.

Alignment

- Before establishing the proposed project, a thorough analysis of the land should be conducted to ensure that the proposed use aligns with the land policy objectives. This analysis should consider the environmental impact, social impact, and economic impact of the facility.
- The developer and contractor should promote sustainability by implementing environmentally friendly practices such as using renewable energy, reducing waste, and conserving water resources. This will help to reduce the environmental impact of the facility and promote sustainable development.
- The proposed project is in complete cognizance of the provision of physical planning. As the proposed project will be utilizing the land for the development of infrastructure, the objectives of the National Land Policy must be considered and implemented during the ESIA process.
- The proposed project developer and contractor should participate in land use planning to ensure that the facility is integrated into the overall land use plan. This will help to ensure that the facility is aligned with the land policy objectives and promotes sustainable development.

¹¹https://www.environment.gov.rw/fileadmin/user_upload/Moe/Publications/Policies/Revised_National_Land_Policy-Final_Version_2019.pdf

2.2.1.11 National Sanitation Policy, 2016¹²

The Water and Sanitation Policy of Rwanda seeks to create favorable conditions for fair and sustainable access for the population, clean drinking water and appropriate sanitation infrastructure, and the development of natural resources. The National Sanitation Policy has been developed as an Umbrella Policy that provides guiding principles for all aspects of sanitation, including liquid and solid waste, industrial waste, nuclear waste, e-waste, healthcare waste, and hygiene.

More specifically, the National Sanitation policy seeks to:

- Implement improved sanitation for schools, health facilities, and other public institutions and locations.
- Develop safe, well-regulated, and affordable off-site sanitation services for densely populated areas.
- Enhance stormwater management in urban areas to mitigate impacts on properties, infrastructure, human health, and the environment.
- Implement integrated solid waste management.
- Ensure safe management of e-waste, industrial waste, nuclear/radioactive waste, and healthcare waste.
- Develop the sanitation sub-sector's institutional and capacity-building framework.

The Policy seeks to achieve this by improving the living conditions of the population through optimal use of water resources and access of all, to water and sanitation services. For the policy to be in effect, laws will be put in place to ensure that land uses near water regimes are properly managed to avoid loss of quality and quantity.

Alignment

- It is in this context that the proposed infrastructures will adopt technologies that do not deplete water resources and optimize the use of water resources throughout its phasing, with very adequate and clean infrastructures.
- The developer will ensure there are water and sanitation facilities with acceptable standards and properly managed to guarantee the quality and quantity of water resources.
- To ensure responsible waste management, the proposed project must comply with the waste management plan for KIA. It should also aim to reduce waste generation by minimizing the amount of waste produced and promoting recycling or reuse of materials whenever feasible.

2.2.1.12 Natural Cultural Heritage Policy, 2015¹³

The culture of any country is an integral part of its overall political and socio-economic development framework. It is an embodiment of Social and cultural practices, rituals, and festive events that structure the lives of communities and groups within the Nation States. The mission of the cultural policy is to provide an appropriate framework for the preservation and protection of Rwandan culture to provide a foundation upon which the country's sustainable development is anchored.

The policy seeks to achieve its goals which are:

¹²https://rura.rw/fileadmin/Documents/Water/Laws/NATIONAL_SANITATION_POLICY_DECEMBER_2016.pdf

¹³https://en.unesco.org/creativity/sites/creativity/files/qpr/national_cultural_heritage_policy.pdf

- To provide a framework for nurturing, preserving, and protecting Rwandan culture and use it as an effective mechanism for the realization of the country's development goals.
- To strategically position culture as a tool for enhancing good governance and social cohesion among Rwandans.
- To enable the culture to shape our attitudes and mindset in order to realize our planned development goals across all sectors of the nation's life.
- To enrich business potential and opportunities embedded in the Rwandan cultural heritage will contribute to the development goals.

Alignment

- The proposed project aligns with this policy by offering cultural experiences for their customers, such as cultural performances or exhibitions. This can help to promote the country's cultural heritage and give visitors a unique and memorable experience.
- The proposed Aircraft hangar and CoE aviation training centre project can incorporate cultural elements into the design of the buildings, such as artwork, sculptures, or murals that reflect the country's cultural heritage. This can help to create a sense of place and identity and celebrate the country's unique cultural heritage.

2.2.1.13 National Urbanization Policy, 2015¹⁴

Urbanization is an opportunity for socioeconomic growth. Well-planned urbanization may help achieve the proper use of land, and other natural resources and investment into infrastructure services and may help initiate local economic development. The overall goal of the National Urbanization Policy is to promote good urban development that enhances local and national economic growth and ensures good quality of life for everyone.

The policy addresses all aspects of cross-sectoral action in urban development and governance. Rwanda guides urbanization in a way to efficiently use and manage its natural resources while promoting sustainable development, reinforcing its system of urban areas and human settlements for local economic development based on local potentialities and inter-linkages, promoting densification for cost-effective public investment and infrastructure service delivery, and to preserve land for agricultural production, open space and conservation of the environment, and plan for the needs of the transportation, housing, culture, recreation, utilities, waste management, information and telecommunication, commercial and industrial development in response to macro-economic strategies and citizens views.

Urban physical development is guided in a way to create a functional network of development poles, which accommodate rapid urban growth, cost-effectively provide socioeconomic opportunities to all, and offer livable and green urban environments.

Given the minimum land resources existing in Rwanda, the need to ensure resource-efficient and compact urban development based upon green development principles and strategic investment phasing practices is fundamentally expressed under the densification pillar, with the aim of building a network of compact, integrated, connected and climate-resilient urban settlements.

Alignment

¹⁴ https://bpmis.gov.rw/asset_uplds/files/National%20Urbanization%20Policy.pdf

- The proposed Aircraft hangar and CoE aviation training centre project will promote sustainable development by implementing eco-friendly practices such as reducing carbon emissions materials, using renewable energy sources, and minimizing waste.
- The project proponent and contractor will engage with relevant government agencies, stakeholders, and the local community. By working together, the project can be designed and implemented to align with the policy's objectives and contribute to sustainable urbanization in Rwanda.
- The aviation training center can contribute to human resource development by providing high-quality training to students interested in pursuing a career in the aviation industry. This will help to develop a skilled workforce that can contribute to the development of the aviation industry in Rwanda.

2.2.1.14 Kigali City Master Plan, 2020¹⁵

The Kigali City Master Plan 2020 introduces a more equitable, flexible, and incremental approach to city development, aligned with UN-HABITAT principles and supporting the United Nations Sustainable Development Goals. The new updated Kigali Master Plan 2020 has a population projection of 3.8 million residents and an employment projection of 1.8 million jobs, thereby leading to the economic and social growth of Kigali for the next 30 years.

Kigali Master Plan will enhance green growth. Planners aspire to strike a fine balance between rapid development and protecting the city's greenery, biodiversity, and heritage. The Master Plan put in place various strategies to adapt to the realities of climate change, particularly rising global temperatures, and rising sea levels. It will mitigate flood risks, improve drainage infrastructure and, where possible, integrate them with other developments to optimize land use.

Kigali Master Plan aims to be more inclusive by facilitating a higher degree of social and economic inclusion, allowing for more social and economic mix in the city, favoring small and large investors, and facilitating the creation of a large variety of affordable housing solutions, hence supporting the growth of a healthy and well-balanced community.

The purpose of these Regulations is to explain the proposed Zoning Plan and Development Control Regulations which will encourage and guide Public Institutions, the Private Sector, National and International Organizations, and Citizens in the implementation of the Kigali City Master Plan and in the harmonic and balanced development of Kigali. The Transport Zone is established to identify and locate major transport-related areas including public transport services such as BRT, airports, railway and depots associated with public transport uses, transport terminus, and cable car stations.

Alignment

- The proposed Aircraft hangar and CoE aviation training centre project will be designed and built in the context of the objectives of Kigali City Masterplan 2020, in accordance with where the site is located.
- The project proponent, contractor, and relevant government authorities will ensure that the aviation hangar and academy training center project is designed with sustainability in mind, taking into account environmental impact and energy efficiency, by incorporating green building practices and technologies, such as solar panels, rainwater harvesting, and energy-efficient lighting.

¹⁵<https://masterplan2020.kigalicity.gov.rw/portal/apps/webappviewer/index.html?id=218a2e3088064fc6b13198b4304f3d35/>

- The proposed project site is compatible with the city's land use policies and zoning regulations.

2.2.1.15 National Policy on Occupation Safety and Health¹⁶

The Occupational Safety and Health (OSH) is a global concern that seeks to improve the welfare of workers through the transformation of the workplace environment to make it safe and Healthy to work in. OSH seeks to configure workplace processes and procedures so that workers' interaction with the work environment and equipment achieves standards that guarantee optimum Safety and Health. The National Policy for Occupational Safety and Health (OSH) should therefore be a key tool, complementing poverty reduction and other National development programs.

In order to provide a solution to OSH-related problems, the Government is committed to having a tripartite National Policy on OSH which will be implemented through the following strategies:

- To strengthen the coordination and synergy among stakeholders.
- To harmonize laws and regulations, standards & guidelines on OSH.
- To improve OSH inspection
- To introduce Preventive Workplace Culture.
- To maintain and enhance OSH competence.
- To establish and implement the integrated OSH information system.

Alignment

- The proposed Aircraft hangar and CoE aviation training centre project should develop and implement an OSH policy that outlines the organization's commitment to ensuring a safe and healthy work and learning environment. The policy should be in line with the National OSH regulations and standards.
- A risk assessment should be conducted to identify potential hazards and risks within the aviation hangar and academy training center. The assessment should consider all aspects of the facility, including the buildings, equipment, and processes. The project proponent and contractor will establish an OSH management system to manage and control the identified hazards and risks.
- The Aircraft hangar and CoE aviation training centre project should adhere to this strategy's pertinent laws and recommendations. This will involve giving employees personal protective equipment (PPE), putting in place training programs to instruct employees on safety procedures, and setting up procedures for handling accidents and emergencies, as well as ensuring that all equipment and facilities are maintained and inspected regularly to ensure their safety and good working condition.

2.2.1.16 National Gender Policy, 2021¹⁷

The vision of the National Gender Policy is for Rwanda to become a nation that enjoys gender equality and equity toward national and sustainable transformation. The mission is to ensure that gender gaps across sectors are addressed by accelerating the effectiveness of gender mainstreaming, gender-responsive interventions, and gender accountability to position Rwanda as a global model in promoting gender equality. The overall goal of this policy is to improve gender equality and equity in various sectors while increasing

¹⁶<https://www.mifotra.gov.rw/index.php?eID=dumpFile&t=f&f=9142&token=e9d43922ec21049c4a2cca05c644293e367bd888>

¹⁷https://www.migeprof.gov.rw/fileadmin/user_upload/Migeprof/Publications/Guidelines/Revised_National_Gender_Policy-2021.pdf

women's access to productive economic resources and opportunities and ensuring that women and men are free from any form of gender-based violence and discrimination.

The Policy objectives aim to:

- Strengthen gender mainstreaming and accountability across national sector policies, planning frameworks, and strategies in the public and private sectors.
- Ensure equal access and control of productive resources and economic opportunities for women and men, boys, and girls.
- Improve gender equality in education, health, and social protection programs.
- Identify gaps and address persistent cultural norms, gender stereotypes, and imbalances affecting the principles of gender equality and equity between women and men and girls and boys.
- Strengthen the mechanisms for promoting women's participation in leadership and decision-making positions.

To address issues of gender equality and equity, this policy is structured around different priority areas such as:

Priority area 1: Engendering national planning frameworks, sector policies, strategies as well as programs and initiatives in public and private sectors. The overall objective is to strengthen gender mainstreaming and accountability across national planning frameworks, sector policies, and strategies in the public and private sectors.

Priority area 2: Accelerate women's economic empowerment: the aim is to ensure equal access and control of productive resources and economic opportunities for women and men, boys, and girls.

Alignment

- The proposed project should have policies and practices in place to prevent and address gender-based discrimination, harassment, and violence. This could include training for staff and students on gender sensitivity, as well as procedures for reporting and addressing incidents of discrimination or harassment.
- The proposed Aircraft hangar and CoE aviation training centre project should encourage women's leadership and participation in the aviation industry, including in management positions and decision-making roles. This could include mentorship and leadership development programs for women, as well as efforts to increase the representation of women on industry boards and committees.
- The proposed Aircraft hangar and CoE aviation training centre project will ensure equal opportunities for women and men to access the training and job opportunities that will emanate from the project.

2.2.1.17 National transport policy and strategy, 2021 18

The Government of Rwanda has decided to develop a National Transport Policy and Strategy to address the issues in the entire transport sector and prepare for future transport scenarios. This policy guides development of the transportation system in a way to:

¹⁸https://www.mininfra.gov.rw/fileadmin/user_upload/Mininfra/Publications/Policies/Transport/NATIONAL_TRANSPORT_POLICY_AND_STRATEGY_APRIL_2021.pdf

- Stand as a strategic driver of economic development and a solution for traffic growth, employment, and sustainable land use in conjunction with the National Urbanization Policy and so making service delivery easier and more cost-effective to provide.
- Support development of urban areas and human settlements in the country by strengthening the infrastructure linkages among them in a way that is resource efficient for the national budget and effective for the purpose of the National Strategy for Transformation and Vision 2050.
- Ensure universal access to transportation and reduce social exclusion and become the enabler of social inclusion and prosperity of the Rwandan population.
- Improve coordination and efficiency of institutions involved in the transport sector and promote capacity building at various levels.
- Promote cost-effective public investment and maintain sensitivity for environmentally relevant aspects consequential to the transport infrastructure deployment and mobility habits.
- Plan transport initiatives in accordance with the land use management, housing, culture, recreation, utilities and commodities, waste management, information and telecommunication, commercial and industrial development in response to macroeconomic strategies and citizens' views.
- Promote the creation of job opportunities associated with the deployment, management and operation of transport infrastructure and services.

The government of Rwanda has planned to revamp the air transport systems by massive investments in aviation infrastructure and creating the environment that attracts both public and private participation. Substantial investments have been made to improve Kigali international airport including among others, expansion of the terminal building, rehabilitation of the runway, apron and control towers, and modern navigations aids, etc. In order to cater for forecasted demand, New Bugesera International Airport is under construction.

Air transport offers the opportunity to develop and enhance direct linkages with the rest of the world, thanks to the national carrier, RwandAir, which is developing ties in Africa and beyond. Increasing national and regional competitiveness is pursued actively through enhancing air transport competitiveness. To this end, consistent investments in aviation infrastructure and operations were undertaken, while creating a more attractive legal and institutional environment for public and private participation. These efforts have already paid off, with Kigali International Airport being ranked as one of the best airports in the region. Environmental sustainability has become the core of the GoR's transport policies.

While recognizing these achievements, GoR stands firm in its commitment to continue supporting transport as a core pillar for economic and social development, as significant challenges are yet to be addressed. This policy aims to address the current transport sector challenges through three main policy pillars:

- Policy Pillar: Promotion of sustainable development of an integrated transport infrastructure network.
- Policy Pillar: Enhancement of the quality of transport services.
- Policy Pillar: Reinforcement of capacity building in transport sector and addressing crosscutting issues.

The policy also focuses on improvement of aviation business and operation, in order to provide conditions that will lead to an efficient air transport system. In order to meet the expectation of customers, the government will: improve air navigation, surveillance and traffic control systems to the highest standards requested by ICAO; increase consumer's benefits and choices; create more competitive business opportunities in the marketplace; encourage public/private partnerships for the international airports; reduce State's costs in performing its economic regulatory functions; and develop the capacity for international air cargo services.

Alignment

- By the year 2063, Africa will have established the essential infrastructure required to facilitate the continent's rapid integration, growth, technological advancement, and trade and development. Within this framework, the proposed project aims to contribute by supplying well-trained professionals in various sectors of the aviation industry, ensuring they are equipped to meet the industry's demands.
- Furthermore, the project intends to collaborate with pertinent international organizations operating in the aviation sector. This collaboration seeks to enhance air transport services, making them safer and more dependable for the region.
- The CoE training center will contribute to reinforcing capacity building in the transport sector, as outlined in the policy. By providing training and education in aviation-related fields, the CoE will help develop a skilled workforce to meet the demands of the aviation industry.
- The construction of the aircraft hangar and CoE aviation training center will be carried out in alignment with the policy's focus on sustainable development. This includes considerations for environmentally relevant aspects. The construction process will incorporate sustainable building practices, energy efficiency measures, and waste management strategies, promoting environmentally conscious infrastructure development.

2.2.2 Legal Framework

2.2.2.1 Constitution of the Republic of Rwanda, 25th December 2015¹⁹

It should be noted at the outset that, all laws and regulations in Rwanda must be aligned with principles in the Constitution. The Rwandan Constitution was approved in a national referendum and adopted in Parliament on 25th December 2015. Through the Rwandan Constitution, the people of Rwanda are committed to building a State governed by the rule of law, based on respect for human rights, and freedom and on the principle of equality of all Rwandans before the law as well as equality between men and women. According to the Constitution of the Republic of Rwanda:

Article 12. Right to life

Everyone has the right to life. No one shall be arbitrarily deprived of life.

Article 3: Supremacy of the Constitution

The Constitution is the supreme law of the country.

Any law, decision or act contrary to this Constitution is without effect.

Article 13. Inviolability of a human being

A human being is sacred and inviolable. The State has an obligation to respect, protect and defend human beings.

Article 16. Protection from discrimination

All Rwandans are born and remain equal in rights and freedoms. Discrimination of any kind or its propaganda based on, inter alia, ethnic origin, family or ancestry, clan, skin color or race, sex, region,

¹⁹https://www.aripo.org/wp-content/uploads/2018/12/RWANDA_CONSTITUTION_NEW_2015_Official_Gazette_no_Special_of_24.12.2015.pdf

economic categories, religion or faith, opinion, fortune, cultural differences, language, economic status, physical or mental disability or any other form of discrimination are prohibited and punishable by law.

Article 21: Right to good health

All Rwandans have the right to good health.

Article 22: Right to a clean environment

Everyone has the right to live in a clean and healthy environment.

Article 24. Right to liberty and security of person

A person's liberty and security are guaranteed by the State. No one shall be subjected to prosecution, arrest, detention, or punishment unless provided for by laws in force at the time the offense was committed. No one shall be subjected to security measures except as provided for by law and for public order or State security reasons.

Article 35: Private ownership of land and other rights related to land are granted by the State.

A law determines modalities of concession, transfer, and use of land.

Article 53: Everyone has the duty to protect, safeguard and promote the environment.

The state ensures the protection of the environment. A law determines the modalities for protecting, conserving, and promoting the environment.

Compliance

- The proposed project will be implemented while considering that the provisions of the constitution are above any other law that will be used in reference.
- The proposed Aircraft hangar and CoE aviation training centre project will comply with all environmental regulations and take steps to minimize its impact on the environment. This includes proper waste management, energy conservation, and responsible use of natural resources.
- The proposed Aircraft hangar and CoE aviation training centre should comply with all laws and regulations in Rwanda, including labor laws, tax laws, and aviation regulations.
- The proposed project implementation should not discriminate against any individual or group of individuals based on their race, ethnicity, gender, religion, or any other protected characteristic. The training center should ensure equal opportunities for all individuals regardless of their background.
- The proposed project will ensure that all facilities, equipment, and training programs are safe and comply with health and safety regulations. The center should take appropriate measures to protect the health and safety of students, employees, and visitors.

2.2.2.2 Law N°48/2018 of 13/08/2018 on Environment

The most relevant legislation and priority concern for this study is Law N°48/2018 of 13/08/2018 on the environment. This Law determines modalities for protecting, conserving, and promoting the environment against climate change.

The law establishes (1) the conservation and the protection of the natural environment (soil, water resources, biodiversity, atmosphere, etc.), (2) obligations to the state, decentralized entities, and local communities with regard to the protection and promotion of environment, (3) the inspection and criminal investigation power in environmental matters. This law aims at conserving the environment, people, and their habitats and setting up strategies for protecting and reducing negative effects on the environment and

replacing the degraded environment among others. The law gives right of every natural or legal person in Rwanda to live in a healthy and balanced environment. They also have the obligation to contribute individually or collectively to safeguard a country's natural, historical, and socio-cultural heritage. The framework of the law on the protection and management of natural resources centers on avoiding and reducing the disastrous consequences on the environment. It measures results from an environmental evaluation of policies, programs, and projects, aimed at preventing the consequences of such activities.

The principle of sustainability of the environment and equity among generations emphasizes human beings at the core of sustainable development. They, therefore, have a right to a healthy and productive life in harmony with nature. They must equitably meet the needs of the present and future generations²⁰.

The Environmental law has the following objectives:

- To protect humans and the natural environment.
- To establish fundamental principles of management and protection of the environment against all forms of degradation, to develop natural resources, and to fight all kinds of pollution and nuisances.
- To improve the living conditions of the population while preserving ecosystems and available resources.
- To ensure a sustainable environment and resources as well as rational and sustainable use of resources, considering the equality between the present and future generations.
- To guarantee to all Rwandans an economically viable, ecologically rational, and socially acceptable development.
- To establish the precaution principle to reduce the negative effects on the Environment and ensure the rehabilitation of degraded areas.

Article 18: Solid waste management, no person is authorized to discard solid waste in an inappropriate place. Solid waste must be sorted, collected, and transported to appropriate destinations in accordance with relevant laws. Solid waste must be disposed of in an appropriate landfill or in a waste processing factory for production purposes.

Article 30: Projects that must undergo an environmental impact assessment and its procedure, the list of projects that must undergo an environmental impact assessment before they obtain authorization for their implementation is established by an Order of the Minister. An Order of the Minister also issues instructions and procedures for conducting environmental impact assessment.

Article 42 states that Water resources must be protected from any source of pollution. Swamps with permanent water and full of swamp vegetation must be given special protection considering their role and importance in the preservation of biodiversity.

Article 43 states that acts that cause emission of harmful noise, or which are detrimental to human health, are prohibited. Any noise emission must comply with standard regulations set by a competent authority.

Article 46 states that any person who does not carry out an environmental impact assessment before launching any project that may have harmful effects on the environment while it is required is punished by suspension of his/her activities or closure of his/her association, and ordered to rehabilitate the damage to environment, persons, and property. He/she will also pay an administrative fine of (2%) of the total cost of the project. It also states that any person who drains swamps without prior authorization of the competent authority is liable to an administrative fine of three million Rwandan Francs (FRW 3,000,000).

²⁰ <https://waterportal.rwb.rw/sites/default/files/2018-10/Water%20law%20gazetted%2C2018.pdf>

The applicability of this law lies in the fact that it empowers the project stakeholders to take legal actions against the developer of the Aviation hangar and academy training center project for any negative environmental and social consequences that may arise from the project implementation. The ESIA process is being conducted to comply with the requirements of the Law on Environment No 48/2018 of 13/08/2018.

Compliance

- The proposed Aircraft hangar and CoE aviation training centre should obtain an Environmental Impact Assessment Certificate from the Rwanda Development Board before commencing its operations. The certificate will specify the environmental requirements that the center must meet.
- The proposed project should implement a waste management plan that includes proper segregation, storage, and disposal of waste, as well as minimizing the amount of waste generated and recycling or reusing materials whenever possible.
- The proposed project will take steps to reduce its energy consumption and promote energy efficiency. This can be achieved by installing energy-efficient lighting and equipment, implementing a waste heat recovery system, and utilizing renewable energy sources such as solar or wind power.
- Rwanda Environment Management Authority should monitor the environmental performance and compliance of the proposed project with environmental laws and regulations as well as regular environmental audits to identify areas for improvement.
- The proposed project should prevent air pollution by controlling emissions from its operations, such as exhaust gases from aircraft engines and ground support equipment. This can be achieved by using low-emission equipment, implementing maintenance programs to keep equipment in good condition, and promoting sustainable practices such as teleconferencing instead of air travel when feasible.

2.2.2.3 Law n°49/2018 of 13/08/2018 Determining the Use and Management of Water Resources in Rwanda.

The law determining the use and management of water resources regulates the use, conservation, protection, and management of water resources and defines the rules for the use, conservation, protection, and management of water resources. Water resources are used and managed in accordance with the following principles²¹:

1° Prevention of pollution with priority to the source.

2° precaution, according to which activities considered or suspected to have negative impacts on water resources shall not be implemented even if such impacts have not yet been scientifically proven.

Scientific uncertainty must not be taken into consideration for the benefit of destroying water resources, instead, it may be used in the conservation of water resources.

3° integrated management of water resources within the catchment, considering the interests of all water users, land and other natural resources, and related ecosystems.

4° participation, according to which all interested stakeholders, including water users through their representatives, are entitled to participate in water resources management and planning.

5° “user-pays and polluter-pays” principles, according to which the user of water and the polluter must support a significant part of expenses resulting from measures of prevention, of pollution reduction and restoration of the water resources in quality and in quantity.

²¹ [Water law and Catchment Management Committee \(rwb.rw\)](http://www.rwb.rw)

6° subsidiary whereby development and protection of water resources is planned and implemented at the lowest appropriate level.

The Minister, by an Order, may establish protected areas, to protect vulnerable water resources, floodplains, wetlands within a catchment against depletion or quality degradation, to prevent erosion or other harmful effects.

Article 12: Water resources protection

Water resources must be protected from any source of pollution.

Swamps with permanent water and full of swamp vegetation must be given special protection considering their role and importance in the preservation of biodiversity.

The proposed project will require water during the construction and operation phases. The provisions of this act are relevant in ensuring water resources are sustainably utilized.

Article 16 specifies that the State establishes mechanisms of coordinating the monitoring of water resources quantity, quality, and use of water resources of each catchment.

According to article 20, the management of water resources is undertaken within hydrographic boundaries of lakes and their catchments in accordance with integrated water resources management principles.

Compliance

- The proposed project proponent and relevant authorities should first identify the water resource laws and regulations that are applicable to their operations. These could include federal, state, and local laws and regulations.
- The proposed project proponent and relevant authorities will conduct a water audit to identify their water usage, sources of water, and potential areas for improvement in water management. This audit will help them understand their current water usage and identify opportunities to reduce their water consumption.
- The proposed project will implement water conservation measures such as using low-flow fixtures, capturing and reusing rainwater, and monitoring water usage to detect leaks and wasteful practices.

2.2.2.4 Law NO 064/2021 of 14/10/2021 governing biological diversity

Rwanda is enriched with diverse habitats and ecosystems that range from humid montane forests to savannahs, lakes, rivers, and wetlands which support a wide range of biodiversity. Biodiversity and natural resources play an important role in terms of supporting the country's economic growth, and livelihoods as well as in the provision of critical ecosystem services such as water, soil erosion, and flood control as well as climate change mitigation²².

Today, the country's biodiversity faces various threats that have led to the loss of species, shrinkage in population sizes, and ecosystem degradation. Thus, the purpose of this Law is to conserve, manage, protect, and promote biological diversity.

Article 13 of the Protection and Conservation of biological diversity states that every person has the duty to defend, protect, conserve, and promote biological diversity.

²² <https://gazettes.africa/archive/rw/2021/rw-government-gazette-dated-2021-11-11-no-special.pdf>

Article 21: An Order of the Minister establishes a list of ecosystems that are threatened in the country and in need of protection and their location. It also determines activities prohibited in the ecosystems.

Compliance

- During the implementation and operations of the proposed project, the developer shall consider the list of protected species as a measure to avoid negatively affecting protected species and take all action to protect and conserve the biological diversity in the project's area of influence.
- The proposed project proponent will conduct a biodiversity assessment to determine the impact of their operations on local ecosystems and wildlife. This assessment should identify any endangered or threatened species that may be affected by the facility's activities.
- Based on the biodiversity assessment, the proposed project will require developing a biodiversity management plan that outlines measures to minimize the impact of their operations on local ecosystems and wildlife. This plan should include specific targets for protecting biodiversity, timelines for achieving those targets, and strategies for achieving them.

2.2.2.5 Land Law N° 27/2021 of 10/06/2021²³

This Law determines modalities of acquisition, registration, allocation, possession, transfer, management, and use of land. In Rwanda, land is one of the primary livelihood assets of rural citizens. Yet, with Rwanda's population density the highest in Africa land is extremely precious for communities there and oftentimes a source of conflict. As such, land in Rwanda has emerged as one of the most pressing issues facing the government of Rwanda and Rwandan citizens, heralding a need for broad information sharing about land matters coupled with solid research on land issues that can feed an adaptive policy environment.

The law in article 2 defines land as a field, a plot or a farm located in a known geographical area and with boundaries, including its airspace, the objects underground, the surrounding biodiversity, structures and developments on that surface whereas land right is the inalienable ability of a person to obtain, possess and utilize land at their discretion so long as their activities on that land do not violate the inalienable rights of others.

Article 55: Fundamental principles governing use of lands. The fundamental principles governing use of land are as follows:

- The land use and development must be administered and managed so as to contribute to the sustainable development for the benefit of current and future generations of Rwanda.
- The land use must help in minimizing the need for land development based on the excessive use of land, energy and natural resources.
- Land use and development must take into account gender considerations.
- Land use must prevent urban sprawl, maximize mixed zoning and integrated land uses.
- Land use must consider all categories of land use.

The land is part of the common heritage of all the Rwandan people: the ancestors, present and future generations, notwithstanding the recognized rights of people, only the State has the supreme power of management of all land situated on the national territory, which it exercises in the general interest of all with a view to ensuring rational economic and social development as defined by law.

Compliance

²³ https://www.rema.gov.rw/fileadmin/user_upload/5-Land_Law_2021.pdf

- The land necessary for the project will be acquired with respect to land law provisions and in accordance with the terms of the concession agreement.
- All project activities that are likely to pollute underground sources will be carried out in a manner of protecting, conserving, and exploiting land in a productive way.
- In compliance with this law, principles applicable to rights recognized over all lands situated on Rwanda's national territory and all rights united or incorporated with land, whether naturally or artificially must be considered.

2.2.2.6 Law N° 66/2018 of 30/08/2018 regulating labor in Rwanda²⁴

The Law applies employment relations based on employment contract, apprentices, interns, self-employed person, informal sector, occupational health and safety and the right to form trade unions and employers' associations. In its **article 6** state that it is prohibited to subject a child below the age of eighteen (18) years to any of the following forms of work:

- Forms of work which are physically harmful to the child.
- Work with dangerous machinery, equipment, and tools, or which involves the manual handling or transport of heavy loads.
- Work in an environment which exposes the child to temperatures, noise levels or vibrations damaging to his/her health.

Article 8: state that sexual harassment in any form against supervisee is prohibited. It is prohibited to dismiss an employee for having reported or testified on sexual harassment committed by his/her supervisor.

Article 9: An employer is prohibited from discriminating employees on basis of ethnic origin, family or ancestry, clan, skin color or race, sex, region, economic categories, religion or faith, opinion, fortune, cultural difference, language, physical or mental disability or any other form of discrimination.

Article 11: Conclusion of an employment contract where the following should be regulated.

- An employment contract is concluded based on the mutual consent of the employee and employer.
- Employment contracts between an employee and more than one employer are acceptable if they are not compromising one another.
- An employment contract can be for a fixed term or indefinite. The employment contract can be written or unwritten.
- An Order of the Minister in charge of labor determines the core elements of written employment contract.
- However, the duration of an unwritten employment contract cannot exceed ninety (90) consecutive days.
- Proof of an employment contract can be established by any means.

Article 56: A female employee who has given birth is entitled to a maternity leave of at least twelve (12) consecutive weeks.

Article 77: An employer must ensure the health, safety, and welfare in the workplace for employees working in his/her enterprise and for all persons who frequent the enterprise.

Compliance

- The developer will ensure that implementation activities of the proposed project are abiding to conducive working conditions.

²⁴ https://www.gmo.gov.rw/fileadmin/user_upload/laws%20and%20policies/New_Labour_Law_2018.pdf

- The labor law will be observed to ensure good working conditions and wellness, and that all forms of discrimination are avoided during recruitment of workers.
- The developer has considered equal opportunities for both women and men in training and hiring for project activities as provided by the law.
- The developer will not hire children for any form of project work, and as much as possible contribute to upholding their rights.
- The developer will issue contracts to the workers in order to ensure their working terms and conditions.

2.2.2.7 Law N° 58/2018 Of 13/08/2018 on Mining and Quarry Operations²⁵

The Mining and Quarry operations law that came into force in August 2018 came to address health & safety of workers, Environment compliance, raised productivity in production, as well as gender equality in mining. The Law governs mining and quarry operations in Rwanda and applies to the activities of exploration, mining, trading, and processing of minerals and quarry.

Article 4: General principles

The general principles relating to mining and quarry operations are as follows:

- All rights of ownership and control of minerals or quarry products in, under or upon any land in Rwanda are vested in the State notwithstanding personal ownership of land and other properties thereof.
- Mineral exploration, exploitation, processing, and trading are carried out by a person who has been granted a license in accordance with this Law.
- Quarry operations are conducted only by a person who has been granted a license in accordance with this Law.
- The competent authority may designate certain quarries for exclusive exploitation by the Government for the purposes of carrying out projects in the public interest.
- The holder of a license issued under this Law, prior to the commencement of operations, submits to the competent authority an environmental and social impact assessment approved by the relevant public organ.

Article 5: Rights of landowner in a licensed area

The landowner or any other lawful occupier has full rights on that land in accordance with the law governing land in Rwanda.

However, in case there is a discovery of mineral or quarry deposit on any land, the landowner or a lawful occupier is fairly compensated in accordance with the law relating to expropriation in the public interest before the license holder commences the mining operations.

Article 40: Rehabilitation of damaged areas. The holder of a license is bound to the rehabilitation, reinstatement of boreholes and excavations, afforestation, removing buildings and levelling, of any part affected by exploration, mining or quarry operations basing on the environmental impact assessment and in compliance with the law on environment.

Compliance

- Although the mining activities at the quarry are not perceived to be a primary activity of the proposed project, borrow pits will be utilized during pre-construction and construction activities. The

²⁵ <https://rdb.rw/eia/mining-law.pdf>

implementation of the mining policy is necessary to guarantee the preservation, reinstatement, and rehabilitation of the biophysical and socioeconomic ecosystems as well as the effective management of borrow pits and quarries.

- The contractor and developer will ensure that the borrowed pits and quarries are reinstated so as to preserve them as well as the environment.

2.2.2.8 Law N° 18/2016 of 18/05/2016 governing the preservation of air quality and prevention pollution in Rwanda, 2016²⁶

This law determines modalities for preservation of air quality and prevention of air pollution in Rwanda. It applies to all measures aimed at the preservation of air quality as well as all elements or activities likely to affect air quality or pollute the atmosphere.

Article 5: Compliance with minimum air quality standards

Every person must comply with the minimum air quality standards established by the National Authority in charge of setting up regulations for quality standards.

Article 6: Prohibition of emission of chemicals, materials, gas, or hazardous substances

The emission of chemicals, materials, gas or hazardous substances or mixture containing gaseous and toxic substances is prohibited unless such emission is authorized by the Authority in charge of the protection of environment.

Article 7: Emission limit

A person engaging in any activity is required to comply with the highest permissible emission limits of air pollutants from the atmosphere to the living things in accordance with ambient air quality standards.

Article 9: Inspection of air pollutants from transport means.

Any person owning any means of transport of people and goods which is an emission source must control production and emission of air pollutants. Means of transport referred to under Paragraph One of this Article operating in Rwanda must undergo an inspection for emissions control. An Order of the Minister determines modalities and requirements for compliance with permissible emissions limits by the means of transport and other machines using petroleum products.

Article 10: Air pollutants from construction works.

Any person transporting or storing construction materials or materials from construction works, or carrying out demolition of a building or part of a building must avoid air pollution by complying with relevant quality standards.

Article 15: Obligation to comply with air quality.

Every person has the obligation to safeguard and preserve the air quality.

Compliance

- The proposed project will be conducted in a way that preserves air quality.
- The proposed project will reduce the generation of greenhouse gases by utilizing solar power as a source of energy.

²⁶ https://rema.gov.rw/fileadmin/templates/Documents/rema_doc/Laws/Air%20Pollution%20Law.pdf

- The contractor will ensure the use of equipment with minimal gas emissions and will frequently wet the construction site to prevent dust emissions.

2.2.2.9 Law N° 028/2019 of 19/09/2019 relating to Civil Aviation Security.²⁷

The main purpose of this Law is to ensure the safety of passengers, crew, ground personnel and the public in all matters related to safeguarding against acts of unlawful interference with civil aviation. The law seeks to:

1° prevent acts intended to jeopardize the safety of civil aviation by providing for the protection of: a) aircraft used for civil aviation, persons, and goods on board the aircraft; b) airports, persons, and goods at airports; c) air navigation installations which are not at airports.

2° monitor and inspect the conduct of persons at airports and on-board aircraft to ensure aviation security. The Law applies to various individuals and entities, including airport operators, passengers, aircraft operators, catering operators, air cargo security agents, and civil aviation service providers.

The Law is divided into seven chapters, with each chapter covering different aspects of civil aviation security. Chapter II outlines the responsibilities and powers of organs, while Chapter III covers the National Civil Aviation Security Programme. Chapter IV discusses preventive security measures, and Chapter V outlines the response procedures in case of unlawful acts.

Compliance

The developer will seek to adhere to the provisions of the law by:

- Obtaining the necessary licenses and certifications from the Rwanda Civil Aviation Authority (RCAA) to operate as an aviation hangar and academy training center.
- Developing and implementing a comprehensive security program that addresses all aspects of civil aviation security, including preventive measures and emergency response procedures.
- Conducting background checks on all employees, including instructors, maintenance personnel, and other staff, to ensure they have no criminal history or links to terrorism.
- Implementing access controls to prevent unauthorized access to the aviation hangar and training center, including the installation of security cameras and alarms.
- Providing security awareness training to all employees and students to promote a culture of security and vigilance.
- Conducting regular security drills and exercises to test the effectiveness of the security program and identify any areas for improvement.
- Cooperating with RCAA officials during inspections and audits to ensure compliance with the Law N° 028/2019 of 19/09/2019 relating to Civil Aviation Security.

2.2.2.10 Law N°20/2018 Establishing Regulations Governing Civil Aviation²⁸

Law No. 20/2018 is a comprehensive law that establishes regulations governing civil aviation in Rwanda. It provides a legal framework for the regulation of air transport services, aircraft operations, airworthiness, and aviation personnel licensing. The law was passed in response to the growing demand for air transport

²⁷ Law N° 028/2019 of 19/09/2019 relating to Civil Aviation Security.

<https://www.caa.gov.rw/index.php?eID=dumpFile&t=f&f=39946&token=a6f0852003fbc0ef2d9960af47be2a47ed33cabb>

²⁸ <https://gazettes.africa/archive/rw/2018/rw-government-gazette-dated-2018-04-30-no-18.pdf>

services in Rwanda and the need to ensure that the country's aviation industry meets international standards and best practices.

The law establishes the Rwanda Civil Aviation Authority (RCAA) as the regulatory body responsible for the oversight and supervision of civil aviation activities in the country. The RCAA is tasked with enforcing the law's provisions and ensuring compliance with international aviation standards and regulations.

The law covers a wide range of aviation-related matters, including aircraft registration and certification, air navigation services, aerodrome, airfield management, and air transport operations. It also sets out rules and procedures for the investigation of accidents and incidents in the aviation industry.

One of the key objectives of the law is to ensure the safety and security of civil aviation operations in Rwanda. To achieve this goal, the law requires all aviation operators and service providers to comply with international safety and security standards and implement appropriate measures to mitigate risks and hazards.

Overall, the law plays a critical role in the development and growth of Rwanda's aviation industry. By establishing a robust regulatory framework, the law helps to attract investment and promote the sustainable development of air transport services in the country.

Article 11 on powers to maintain civil aviation safety states that:

As part of the Authority's responsibility to ensure the safety and security of civil aviation, the Director General has the following functions including:

1° To develop and promote appropriate, clear, and concise regulatory requirements and technical civil aviation safety and security standards.

2° To develop and implement effective enforcement strategies to ensure compliance with civil aviation safety and security standards.

3° To conduct comprehensive aviation industry surveillance, including assessment of safety and security-related decisions taken by any management of the aviation industry, at all levels, to determine their impact on aviation safety and security.

4° To ensure the publication of all standards and procedures issued under this Law in such form and manner as may be best adapted for public compliance.

Article 14 on the Right of access for inspection stipulates that.

The Director General has the right to unhindered access to inspect all civil aircraft registered in Rwanda, documents, aerodromes, air operator facilities, air navigation services, approved training and maintenance organizations and other important facilities, as well as other restricted civil aviation related sites within Rwanda.

The Director General has the right to unhindered access to inspect all civil aircraft registered in Rwanda wherever they operate in the world. When the Authority's safety inspector is performing the responsibilities of the Authority and upon presenting his/her inspector credentials, the pilot-in-command gives him/her free and uninterrupted access to the flight deck of the aircraft.

Article 16 on Prevention of flight states that

The Director General or his/her proxy has powers to prevent the air operator or a pilot of a civil aircraft from flying the aircraft if: 1° the aircraft is not airworthy or does not meet requirements to navigate; 2° the pilot is

not qualified or is not capable for the flight due to physical or mental disability certified by an authorized medical doctor, the flight may cause imminent danger to persons or property on the ground.

Article 19 on Rwandan aircraft nationality and registration marks stipulates that.

An aircraft registered under this Law acquires a Rwandan aircraft nationality registration mark “9XR” and the registration mark assigned to it by the Authority. Article 20: Eligibility for aircraft registration An aircraft is eligible for registration if it is not registered in another country and if it is owned by: 1° the Government of Rwanda, the Government of any of East African Community Partner States or one of their institutions; 2° a Rwandan, any other person legally residing in Rwanda, a citizen of one of the East African Community partner States or person legally and bona fide resident in the East African Community; 3° bodies incorporated under the Rwandan laws or laws of any of the East African Community Partner States.

Article 23: Requirements for being an aircraft crew member state that.

Every aircraft crew member must hold a valid license issued in compliance with the provisions of this Law and related regulations.

Article 27: Certification of air navigation services stipulates that.

The provision of all air navigation services within Rwanda is subject to certification by the Director General in accordance with the requirements set forth in this Law, related regulations, and safety standards that he/she prescribes.

Article 28: Airworthiness certificate

The Director General issues an airworthiness certificate on the basis of satisfactory evidence that the aircraft conforms to the type certificate issued by the State having jurisdiction over the organization responsible for the type design.

Article 30: Evaluation and issue of certificates to civil aviation training and maintenance organizations

The Director General has the powers to evaluate and issue certificates of capacity for 1° approved civil aviation training and maintenance organizations, civil aircraft and its components flight or maintenance organizations, as to the adequacy of the course of instruction, suitability, and airworthiness of the equipment and competency of the instructors; 2° aircraft and its components maintenance organizations, as to the adequacy and suitability of the equipment, facilities, and competency of those engaged in the work or giving any instruction therein

The Director General authorizes civil aviation training and maintenance organizations to operate depending on the ability of the applicants to comply with the requirements.

Article 34: Compliance with the terms of a license

Any person who is licensed to work in aircraft-related activities has the obligation to comply with the provisions of this Law as well as the related regulations and the license. When necessary, the Director General has the power to take enforcement actions against a licensed person who fails to comply with the provisions of Paragraph One of this Article.

Article 35 on Prohibitions

No person is permitted to operate any aircraft without an airworthiness certificate or in violation of the terms of the certificate; serve in civil aviation in any capacity requiring a license without a license or in violation of regulations implementing this Law; employ an unauthorized person in civil aviation in any capacity that

requires a license; operate as an air operator without an air operator certificate or use such a certificate in ways that violate its provisions

Article 38 on Components of the National Aviation Safety Programme

The National Aviation Safety Programme includes the following components: safety policy and objectives; safety risk management mechanisms; safety assurance; civil aviation safety promotion.

Article 46: Use of aircraft, aerodromes, and Rwanda airspace during the state of siege or state of emergency

An Order of the Minister determines the use of aircraft, aerodromes, and Rwanda airspace during the state of siege or in a state of emergency officially announced. The Order may also instruct those aerodromes be operated by military services if necessary.

Article 48: Obligations of a person holding an air operator certificate.

Every person holding an air operator certificate has a duty to ensure that the maintenance of aircraft and his/her operations are conducted in the public interest and in accordance with the requirements of this Law, related regulations and technical standards issued under this Law by the Director General.

Article 54: Powers to conduct aircraft accidents and incidents investigation.

The Minister is responsible for and vested with powers to investigate or arrange by contract or otherwise for the investigation on aircraft accidents and incidents occurring in Rwanda and civil aircraft registered in Rwanda occurring outside the territory of any other country for the purpose of determining the facts, conditions, and circumstances relating to each accident or incident and the probable cause.

Article 56: Mandatory reporting of an aircraft accident or incident

The owner, operator, pilot-in-command, a crew member of the aircraft, or any person who provides air traffic services who has direct knowledge of aircraft accident or incident must, with details on the nature of the accident or incident and without delay, report the accident or incident to the Minister.

Article 92: Non-compliance with licenses and certificates issued by the Authority.

Any person who forges or alters a license or certificate provided for under this Law in any way whatsoever; uses or attempts to use such license or certificate in any way whatsoever; knowingly and willfully displays or causes to be displayed on any aircraft any marks that are false or misleading as to the country of registration of the aircraft; fails to comply with the requirements set by the license or certificate or makes improper use of them; operates before being issued certificate or license, commits an offense on conviction, he/she is liable to imprisonment for a term of more than five (5) years and not more than ten (10) years and a fine of not less than five million Rwandan francs (Frw 5,000,000) and not more than ten million Rwandan francs (Frw 10,000,000).

Article 111: Failure to comply with regulations issued by the Authority.

Any person who contravenes any provision of regulations, notice, or order made under this Law commits an offense, unless another law provides otherwise. Upon conviction, he or she is liable to imprisonment for a term of not less than six (6) months and not more than one (1) year and a fine of not less than two million Rwandan francs (Frw 2,000,000) and not more than five million Rwandan francs (Frw 5,000,000) or one of these penalties only.

Compliance

- All aviation personnel, including pilots, air traffic controllers, and maintenance personnel, must obtain the necessary licenses and certifications from the Rwanda Civil Aviation Authority (RCAA). Similarly, aircraft and air transport operators must obtain the necessary certifications and approvals from the RCAA to operate in Rwanda.
- All aviation operators and related service providers must implement a Safety Management System (SMS) that conforms to the international standards set by the International Civil Aviation Organization (ICAO). The SMS should identify and manage safety risks and hazards and ensure that appropriate measures are in place to prevent accidents and incidents.
- All aircraft operating on the project site must comply with the airworthiness standards set by the RCAA. Aircraft maintenance and repair operations must also conform to international standards, and the RCAA may conduct periodic inspections to ensure compliance.
- The proposed project must comply with environmental regulations, including noise and emissions standards, to minimize the impact of aviation on the environment.
- All aviation stakeholders must comply with the security measures and requirements set by the RCAA to ensure the safety and security of passengers, crew, and aircraft.

2.2.2.11 Ministerial Order No 001/2019 of 15/04/2019

This Order establishes the list of projects that must undergo an Environmental Impact Assessment before they obtain authorization for their implementation and instructions, requirements, and procedures for conducting an environmental impact assessment.

Article 3 The List of works, activities, and projects that must undergo a full environmental impact assessment.

States that no public institution is authorized to take a decision, warrant a certificate, approve, or authorize the commencement of a project mentioned in the annexes of this Order without prior environmental impact assessment. All buildings classified as residential, commercial, administrative, or institutional sports facilities, social, cultural, assembly and religious buildings, hotels, health facilities, educational buildings or other publicly accessible facilities fulfilling at least two of a number of conditions including: having a total floor area exceeding one thousand and five hundred square meters (1500 sqm); having capacity to host more than five hundred (500) people; and built-in plot size exceeding one thousand square meters (1000 sqm), are subject to the full ESIA.

As per Article 4, the list of works, activities and projects that must undergo a partial environmental impact assessment before being granted authorization for their implementation is in Annex II of this Order²⁹.

The works, activities and projects referred to in Paragraph One of this Article are subject to assessment for an environmental clearance certificate.

Article 5 stipulates that Projects, works and activities which are not listed in Annex I and II to this Order are not subject to the environmental impact assessment. However, when it is evident that work, activity, or project not listed in Annex I and II to this Order has a negative and irreversible impact on the environment and is similar in nature to the work, activity, or project listed in Annex I and II of this Order, the Authority or authorized organ may request the developer to conduct an environmental impact assessment.

Article 7 stipulates “The environmental impact assessment must be based on the terms of reference mentioned in Article 6 of this Order”.

²⁹ <https://faolex.fao.org/docs/pdf/rwa193635.pdf>

The selected expert has a duty to involve the developer in all stages of the environmental impact assessment process. The expert has also a duty to involve the developer of his or her responsibilities and obligations in the implementation of the outcomes of the environmental impact assessment.

The environmental impact assessment is done with due consideration of the opinion of all the relevant stakeholders.

Compliance

- The Environmental and Social Impact Assessment was done with due consideration of the opinion of all the relevant stakeholders.
- Given that the project is listed in the Ministerial order as one that must undergo an EIA, the proposed project should conduct an Environmental Impact Assessment (EIA) to identify potential environmental impacts and propose measures to mitigate them, and the project screening and categorization will be made by the RDB EIA team based on the project brief and EIA report.
- REMA should monitor the environmental performance of the proposed project as well as its compliance with environmental laws and regulations.

2.2.2.12 Ministerial Order N°. 003/16.01 of 15/07/2010 Preventing Activities that Pollute the Atmosphere³⁰

The purpose of Ministerial Order No. 003/16.0133 is to prevent activities that pollute the atmosphere.

Article 2: All activities that give rise to chemical pollutants listed in the annex to this Order shall be controlled in such a way that the pollutants do not exceed the prescribed quantity limits. The list of these pollutants can be updated based on research advancement or whenever it is deemed necessary.

It provides in its annex, ambient air quality tolerance limits, which are based on, and consistent with, the Air Quality Specification of the Eastern African Standard Guideline (CD/T/66/2010).

Table 1: Ambient air quality tolerance limits

Pollutant	Period	Industrial Area	Residential, Rural and Other Areas	Controlled Areas***
Nitrogen Dioxide	Annual Average	150 g/m3	0.05 ppm	
	Month Average		0.08 ppm	
	24 Hours	100 g/m3	0.1 ppm	
	One Hour		0.2 ppm	
	Instant Peak		0.5 ppm	
Suspended particulate Matter (SPM)	Annual Average*	360 g/m3	140 g/m3	70 g/m3
	24 hours**	500 g/m3	200 g/m3	100 g/m3
	Annual Average****		100 g/m3	
	Annual Average*	70 g/m3	50 g/m3	50 g/m3

³⁰https://www.meteorwanda.gov.rw/fileadmin/Template/reports/laws/Ministerial_Order_N_00316.01_of_15.07.2010_preventing_activities_that_pollute_the_atmosphere.pdf

Pollutant	Period	Industrial Area	Residential, Rural and Other Areas	Controlled Areas***
PM10 or Respirable Particulate Matter (PM10)	24 hours**	150g/Nm3	100 g/Nm3	75 g/Nm3
PM2.5	Annual Average	35 g/m3		
	24 hours	75 g/m3		
Lead (Pb)	Annual Average*	1 g/m3	0.75 g/m3	0.5 g/m3
	24 hours**	1.5 g/m3	1 g/m3	0.75 g/m3
	Monthly Average		2.5 g/m3	
Carbon monoxide (CO)/ carbon dioxide (CO2)	8 hours**	5.0 mg/m3	2.0 mg/m3	1.0 mg/m3
	1 hour	10.0 mg/m3	3	3
Non-methane hydrocarbons	Instant Peak	700 ppb****		
Ozone	1-Hour	200 g/m3	0.12 ppm	
	8 hours (Instant Peak)	120 g/m3	1.25 ppm	
<p>Notes:</p> <p>Values are expressed at Standard Temperature and Pressure (STP)</p> <p>* Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.</p> <p>** 24 hourly/8 hourly values should be met 98% of the time in a year. However, 2% of the time, it may exceed but not on two consecutive days.</p> <p>*** Not to be exceeded more than once per year average concentration.</p>				

Compliance aspects

- The Ministerial Order and limits contained within the Air Quality Specification of the Eastern African Standard Guideline should be considered throughout the project life cycle.

2.2.2.13 Rwanda green building minimum compliance system³¹

Rwanda Green Building Minimum Compliance System is conceived as simple, effective, and environmental performance-oriented indicators designed to promote energy & water efficiency, environmental protection, better Indoor Environmental Quality to building occupants and green innovation.

These indicators are mandatory in nature and would be applicable for new Category 4 & 5 buildings as per the Ministerial Order Determining Urban Planning and Building Regulations. The indicators would be applicable for:

- Commercial buildings (excluding warehouses and retail shops)
- Public administrative and institutional buildings (excluding correctional services, police, fire department)
- Social, cultural & assembly buildings
- Health facilities
- Educational buildings (excluding living areas for students)

Although the green building minimum compliance system is not mandatory for residential developments, willing building owners and real estate developers are encouraged to adopt as applicable on a voluntary basis the green building minimum compliance system to meet sustainable development targets.

The green building minimum compliance system comprise of 5 modules or focus areas targeting:

- **Energy efficiency** - This module focuses on the approach that can be used in the building orientation, design, material, and equipment selection to optimize the energy performance in a building.
- **Water efficiency** - This module focuses on rainwater harvesting, selection of water efficient fittings, wastewater treatment and other features that would reduce the use of potable water during building operation.
- **Environmental protection** - This category focuses on the design, practices and selection of materials and resources that would reduce the environmental impacts of built structures.
- **Indoor Environmental Quality** - This category focuses on the design strategies that would enhance indoor environmental quality which includes fresh outdoor air provision, thermal comfort, noise, and selection of non-toxic paints in buildings.
- **Innovation and Other green features** - This category focuses on the adoption of green practices and new technologies that are innovative and have potential environmental benefits.

Compliance

The developer has consider designing and operating the aviation hangar and academy training center that is environmentally friendly and cost-effective by:

- Incorporating energy-efficient design features into the building, such as insulation, cross ventilation, natural lighting, shading devices, and energy-efficient lighting and HVAC systems.
- Choosing building materials that are environmentally friendly, such as recycled or sustainably sourced materials.
- Use of water-efficient fixtures and equipment, such as low-flow toilets and faucets, to reduce water usage.

³¹ Rwanda green building minimum compliance system:

<https://gggi.org/wp-content/uploads/2019/07/Annex-3-Rwanda-Green-Building-Minimum-Compliance-System-REVISED.pdf>

- Incorporating rainwater harvesting and graywater recycling systems to conserve water.
- Encouraging the use of non-motorized pedestrian walkways.
- Implementing a waste reduction and recycling program, including separate bins for different types of waste, to minimize the amount of waste generated on-site.
- Regularly monitoring and maintaining the building's energy and water systems to ensure they are operating efficiently.
- Educating staff and visitors on the importance of sustainability and encouraging them to adopt sustainable practices.

2.2.2.14 Rwanda Civil Aviation Authority Strategic Plan³²

The Rwanda Civil Aviation Authority (RCAA) Strategic Plan for the period 2019/20-2023/24 outlines the goals, and broad objectives of the Authority as well as measurable strategic objectives and strategies to be implemented and achieved during the planning period.

This strategic plan is complimented by law no 007/2019 of 13/04/2019 establishing Rwanda Civil Aviation Authority (RCAA) and determining its mission, organization, and functioning, and law n°20/2018 of 29/04/2018 establishing Regulations governing Civil Aviation. This is the first RCAA strategic plan following its new mandate after the cabinet resolution of 14th October 2017 whereby operation and commercial mandate were separated from regulatory functions. During the development of this strategic plan, RCAA benchmarked the previous strategic plan 2012-2021 and alignment with its new mandate as stipulated in law no 007/2019 of 13/04/2019.

The process to develop this plan included consultations with the various industry stakeholders through visits to their respective workplaces, collecting and considering their inputs submitted using a web-based questionnaire, and two workshops. In this respect, both the board and the Management of Rwanda Civil Aviation Authority appreciate the contribution of everyone who participated in the process of producing this very important document. This strategic plan defines the key strategic objectives and strategies to guide RCAA in the execution of its mandate and evolution to achieve the broad objective of being a world-class civil aviation in Safety, Security, and provision of quality services.

Its implementation will not only facilitate the development of world-class civil aviation in safety, security, and economic regulation but also will create an environment for developing a safe and secure compliant industry that can efficiently compete in both the global, and regional markets and also contribute to the economic development of the country.

Compliance

- The proposed Aircraft hangar and CoE aviation training centre project can comply with the RCAA's safety and security objectives by ensuring that their operations are in line with international safety and security standards. They will implement an aviation safety management system (SMS) that identifies and manages safety and security risks and hazards. They can also work closely with the RCAA to ensure that they comply with all safety and security regulations and requirements.
- The proposed project will comply with the RCAA's service delivery objectives by providing high-quality and efficient aviation services to their customers. They can ensure that their services are customer-oriented and innovative, and they can work with the RCAA to identify areas for improvement in their service delivery processes.
- The proposed project will comply with the RCAA's institutional development objective by strengthening its institutional capacity and governance. They can improve their regulatory and

³² <https://www.caa.gov.rw/corporate-strategy>

operational processes, develop the skills and competencies of their personnel, and enhance their stakeholder engagement and collaboration. They can also participate in training and development programs organized by the RCAA to improve their institutional capacity and governance.

- The proposed project will contribute to the RCAA's infrastructure development objective by investing in the development and modernization of their facilities. For example, they can modernize their equipment and tools, upgrade their technology systems, and expand their facilities to meet the growing demand for aviation services in Rwanda. They can also work with the RCAA to ensure that their infrastructure is in line with the RCAA's infrastructure development plan.

2.2.2.15 Rwanda Building Code³³, 2019.

The purpose of this code is to establish the minimum requirements to safeguard public health, safety and general welfare. This is done through regulating, controlling, and monitoring the design, construction, quality of materials, use and occupancy, location, maintenance, sanitation, lighting and ventilation, energy conservation, and safety including measures to protect life and property from fire and other hazards attributed to the built environment, for all buildings and related non-building structures in Rwanda.

The provisions of this Code shall apply to site planning, building site operations, materials selection, construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, maintenance, removal, and demolition of any building or structure or any appurtenances connected or attached to such buildings or structures in Rwanda. Throughout the world, buildings and other construction works are designed to meet standard requirements, expressed, and established in national and international standards or regulations particular to a jurisdiction. None of these requirements is replaced or changed by this Code. In the event that any part or provision of this Code is held to be illegal or void, this shall not have the effect of making void or illegal any of the other parts or provisions of the Code.

The Rwanda Building Code has been prepared by referring to different laws governing the building construction industry and was given legal effect by the Ministerial Order determining Urban Planning and Building Regulations.

The Rwanda Building Code is structured into 6 chapters, namely general provisions, structure and building materials, fire safety, building services, construction safety, inspection, maintenance, and disaster risk management, and special provisions.

The first chapter establishes the classification of building structures and sets guidelines about development control rules and general requirements for proper planning and design at the layout and building level to ensure public safety and desired quality of life including considerations for people with disabilities. Chapter two provides for structural adequacy of buildings for both internal and external environment. It prescribes minimum structural loading requirements for use in the design and construction of buildings and structural components. It includes minimum design loads, as well as permitted design methodologies. Standards are provided for minimum design loads (live, dead, wind, rain, floods, and earthquakes as well as load combinations). The chapter references rely on many internationally recognized design standards. In particular the chapter covers several components of the building including, but not limited to Soils, Excavations and Foundations, Walling and Roofs, masonry, Concrete, Floors, Systems Building and Mixed/Composite Construction. The provisions of chapter three present the fundamental concepts of fire performance that all buildings are expected to achieve in some form. This chapter identifies the acceptable materials, techniques, and design methods for building ability to limit the impact of fire. Types of separations

³³

http://197.243.22.137/rhanew/fileadmin/user_upload/documents/General_documents/Laws_And_Regulations/rwanda_building_code_2019.pdf

addressed include fire walls, fire barriers, fire partitions, horizontal assemblies, smoke barriers and smoke partitions and interior finishes.

In addition, chapter four elaborates on utilities and provides detailed guidance to concerned professionals/utility engineers for meeting necessary functional requirements in buildings. The utilities include, Energy Efficiency, Lighting and Ventilation, Electrical Installations, Air Conditioning, Heating and Mechanical Ventilation, Acoustics, Sound Insulation and Noise Control, Stairways, Ramps and Guarding, Lifts and Escalators, Security systems, telecommunication installations, plumbing and drainage, Waterborne sanitation, non- Waterborne sanitation, solid waste management. Chapter five covers the construction planning, management, and practices in buildings; storage, stacking and handling of materials, safety of personnel during construction works and demolition of buildings. It also covers guidelines relating to maintenance management, repairs, retrofitting and strengthening of buildings. The objective can be best achieved through proper coordination and working by the project management and construction management teams. The chapter also provides regulations and considerations for maintenance of existing buildings and installations therein, to protect occupants of existing buildings and structures from health and safety hazards arising from the improper maintenance and use of those buildings and structures. It also provides guidelines to protect occupants of existing buildings and structures from health and safety hazards arising from the improper maintenance and use of those buildings and structures. Chapter six promotes the use of indigenous knowledge and home-grown solutions as practically possible but not limited to the following:

- (i) Dealing with special construction exemptions for areas of steep slopes, problematic soils, disaster prone areas of the country, unplanned areas specific rural areas, and densely populated settlements, mobile homes, security facilities and buildings.
- (ii) Dealing with green construction practices for buildings and other structures for resource efficiency, sustainability and affordability aspects including both optimal land use, waste management, erosion control in construction zones, sub-structure and super structure systems and multifunctional public spaces (such as may be used for both recreation biodiversity maintenance and simultaneous waste treatment and flooding controls/alleviations).
- (iii) Dealing with possible and appropriate incentives to motivate and encourage investors to invest in green construction projects as they can be expensive in the short term but sustainable in the long term
- (iii) Dealing with special local materials for walling, binding, roofing, flooring, and interior finishing applications with a focus on local availability and innovation in addition to the special indigenous techniques and constructions as well as local materials considerations in the structure and materials chapter.

Compliance

The Proposed project's activities have to comply with the Rwanda Building Code in these ways:

- The Aircraft hangar and CoE aviation training centre project should select a suitable site for their facilities that meets the Rwanda Building Code requirements for building on safe, stable ground, and that is accessible to all users.
- The proposed project should design its facilities in compliance with the Rwanda Building Code guidelines, including requirements for structural safety, fire safety, accessibility, plumbing and sanitation, electrical systems, and energy efficiency.
- The proposed project should use approved building materials that meet the Rwanda Building Code standards and guidelines for safety, durability, and sustainability.

- Relevant authorities should conduct regular inspections during the construction phase to ensure that the work is being done in compliance with the Rwanda Building Code standards and guidelines.
- The Aircraft hangar and CoE aviation training centre should ensure that their facilities are environmentally sustainable, by complying with requirements for energy efficiency, waste reduction, and water conservation.

2.2.2.16 Rwanda Urban Planning Code (UPC), 2015³⁴

The Urban Planning Code (UPC) provides the principles for the sustainable development and management of land used for human settlement. It is binding for all categories of land within urban areas for any development and investment project, public institutional, tourist, public spaces, urban renewal, and infrastructure servicing.

The UPC intends to provide a basis for forward planning, development management and plan implementation with the following overall objectives:

- Elaborating sustainable physical plans.
- Improved living standards in human settlements.
- Sustainable development of land for human settlement while allocating valuable land resources and location guidelines for urban land uses and facilities.
- Development of housing, socio-economic facilities, and technical infrastructure according to the needs of the people and applying basic standards to site requirements of development.
- Planning of utilities, facilities, and services accordingly, with principles for urban land uses and adequacy of facilities to serve a human settlement.

Site development requirements

When planning for the development of a site, the following requirements shall be fulfilled:

- Urban infill development and development on dilapidated and inefficiently used urban areas shall be prioritized before extending into new settlement areas consuming agricultural land located within the urban boundaries.
- Adjacent or neighboring uses shall be compatible with each other.
- Planning for urban centers shall consider the connectivity of uses and modes of transport, including convenience for pedestrians, circulation and parking areas, loading and unloading.
- The siting of residential buildings shall be in a way to form valuable and usable exterior space, and footprints of new high rise residential buildings shall not be pointed.
- At least 30 % of a developed area shall have a permeable ground surface area.
- The use of vegetation shall be integrated into the design, or a neighborhood and existing mature trees shall be retained wherever possible.
- Set specific densities to ensure optimum land use and where possible plot subdivisions of land can be done to make densification possible.

Fire protection in human settlements

Site planning shall include the following mitigating measures against fire outbreak and transmission:

- Access to all buildings and public spaces must be possible.
- Design shall mitigate causes of fire and possibilities of fire transmission between buildings.

³⁴ <https://housingfinanceafrica.org/app/uploads/Rwanda-Urban-Planning-Code-upc.pdf>

- Every building shall improvise, fix and maintain fire-fighting equipment easily accessible.
- There shall be water points and fire hydrants well accessible within a radius to be specified by the responsible authority.
- The water rate at water points and hydrants available for firefighting shall be secured at 25 m³/hour with minimum availability for 2 hours.
- If points 3 or 4 above are not fulfilled, the responsible fire brigade shall use firefighting engines which are equipped with a water tank.

Plot level service and sanitation infrastructure

For every plot, service and sanitation infrastructure shall fulfill the following requirements:

- Clean water shall be accessible on the plot, and where this is not possible, within 250 m travel distance.
- Leveling shall be in a way to control storm-water runoff, and infiltration into the ground shall be encouraged. The drainage shall be approved by the Local Authority.
- Where a driveway crosses storm-water drainage, a culvert shall be constructed.
- A plot shall have an on-site toilet, and where this is not possible, a communal toilet within 50 m walking distance shall be provided.
- Wastewater shall be directed to a public sewer where it exists, or to a septic tank where this is permissible, or to an alternative on-site treatment system.
- Non-biodegradable refuse shall be stored in proper containers for collection. Biodegradables shall be separated from non-biodegradable waste and composted. Where there is no refuse collection organized through the district, non-recyclable refuse shall be deposited in sites approved by the district.

Environmentally sensitive areas

The following areas shall be considered environmentally sensitive:

- Floodplains
- Wetlands
- Steep slopes, ridgelines, and hilltops
- Open space
- Forests
- Areas of volcanic hazard
- Natural buffer zones.

For open space, the following principles apply: 1) Open space shall be preserved in a way to prevent flood damage, attract investment, revitalize urban areas, and boost tourism along with preserving the environment. 2) Existing vegetation shall be retained in open spaces, and the entire ecosystem shall be protected, such as habitats of rare or endangered species. 3) Conservation areas may be established to protect ecological systems and biodiversity, and to provide corridors and connectivity for wildlife.

Rainwater

The following shall be applied when planning for the use of rainwater. Rainwater shall:

- Be harvested wherever possible from roofs or ground surfaces to reduce the use of potable water for other purposes than human consumption.
- Be used to the best feasible extent in irrigation, toilets, and showers or for washing, to reduce the used amount of treated water where possible.

Rainwater may be considered as source of potable water in areas where access to safe drinking water is a challenge when: 1) The roofing material is suitable to not pollute the running of water; or 2) The collected water is treated by sand filtration, ceramic filtering, solar water disinfection, or addition of chlorine, in case the roof material is unsuitable.

Stormwater and Erosion Control Planning and Management

The following principles shall be applied in storm water management and erosion control:

- Sediment and solid pollutants shall be captured and treated before storm water enters the environment.
- Natural vegetation and other areas that filter runoff and reduce erosion shall be preserved.
- Storm water runoff shall be minimized through the support of infiltration into the ground by one or more of the following measures: a. Minimizing impermeable surfaces; b. Allowing water to run in sheet flow through vegetation; c. Installing permeable material below ground depending on the soil conditions.
- Storm-water runoff shall discharge into one of the following: a. An adequate soak away or other adequate infiltration system; b. Swales, basins, and ponds if sites are large enough; c. A watercourse; A storm water channel or sewer.
- Infiltration measures shall be combined with rainwater collection where possible.
- Erosion from a site caused by land-disturbing operations shall be prevented or at least reduced by controlling energy, velocity, and volume of runoff through soil stabilization and structural measures.
- Any physical impact on slopes steeper than 20 % and highly erodible soils shall be avoided.
- During construction: a. the physically disturbed area shall be limited; b. area-wide clearing be avoided, and c. use of retaining walls to reduce the development footprint be considered. A storm-water management and erosion control plan shall: specify road gradation, dimensions of channels, sedimentation ponds and constructed wetlands, energy dissipaters on steep slopes, discharge of effluents, erosion control measures and their maintenance, upkeep, and inspection.

Compliance

- The proposed project shall be built in accordance with the requirements of this urban planning code.
- The construction of the Aircraft hangar and CoE aviation training centre must comply with the building codes and regulations set out by the RHA. These codes cover aspects such as the minimum standards for building materials, structural design, fire safety, and accessibility.
- The Aircraft hangar and CoE aviation training centre must comply with environmental regulations related to waste management, water usage, and air pollution control.
- The Aircraft hangar and CoE aviation training centre must provide adequate parking spaces for employees, customers, and visitors.
- The Aircraft hangar and CoE aviation training centre must comply with safety regulations related to the storage and handling of hazardous materials, fire safety, and emergency preparedness.

2.3 Institutional Framework

2.3.1 Ministry of Infrastructure, MININFRA

Ministry of Infrastructure (MININFRA) is the government authority mandated to ensure sustainable infrastructure development covering transport, energy, water supply and sanitation, housing and human settlement sectors aiming to drive Rwanda's economic growth and enhance quality of life of the citizen.

The mission of the Ministry includes:

- To initiate programs to develop, rehabilitate and maintain an efficient and integrated national transport infrastructure network, including roads, bridges, airports, railways, and water transportation which will contribute towards economic development and regional integration.
- To initiate programs aimed at increasing access to affordable energy, water and sanitation, and transport infrastructure and related services for the population.
- To ensure that the development of policies and strategies concerning national infrastructure are in line with regional integration and harmonization policies with the EAC.
- To supervise activities meant to elaborate, monitor, and assess the implementation of national policies and programs on matters relating to habitat and urbanism, transport, energy, water, and sanitation.
- To supervise the implementation of quality standards and norms, cost effectiveness, response to environmental sustainability, safety, and cross-cutting issues in infrastructure development.
- To orient and supervise the functioning and management of public institutions, agencies and companies under the Ministry of Infrastructure including existing agencies such as Road Maintenance Fund (RMF), Rwanda Civil Aviation Authority (RCAA), Rwanda Energy Group (Energy Development Company Ltd and Energy Utility Company Ltd), Water and Sanitation Corporation Ltd, Rwanda Transport Development Agency (RTDA), Rwanda Housing Authority (RHA), RwandAir and other agencies to be formed under its sub-sectors.

The ministry ensures formulation of national policies and strategies; sector oversight, budgeting, and resource mobilization, for transport infrastructure development projects in the country such as the proposed Aircraft hangar and CoE aviation training centre project.

2.3.2 Ministry of Environment, MoE

The position of environment in the overall national governance framework in Rwanda has become more prominent with successive institutional reforms. The environmental sector is a crosscutting subject within different Rwanda Government institutions. At the institutional level, the Ministry of Environment (MoE) is responsible for formulating policies relating to environment. MoE ensures the follow up and evaluation of policies, strategies as well as environment protection and draft bills and establishes norms and practices for rational exploitation and efficient land management, environment, water resources and evaluate their implementation. The ministry must also ensure the safeguard of green and climate resilience for growth of the economy.

Given that the ministry is responsible for developing policies and programs related to environmental conservation, sustainable development, and climate change mitigation and adaptation, it can play a role in ensuring that the Aircraft hangar and CoE aviation training centre project is carried out in an environmentally sustainable and socially responsible manner that has no negative impacts on local ecosystems and communities.

2.3.3 Ministry of Local government, MINALOC

The Ministry of Local Government ensures the coordination of good governance and high-quality territorial administration programs that promote economic, social and political development throughout the nation.

Among its several responsibilities, the ministry has the responsibility to develop, disseminate and coordinate the implementation of policies, strategies and sector programs through the formulation of national policies, strategies and programs of good governance, territorial administration, social affairs and

group settlement sites to ensure sustainable community development; to develop institutional and human resources capacities; to monitor and evaluate the implementation of policies, strategies and programs.

In terms of environment, it encompasses activities aimed at informing and educating the public about the environment in various local administrative units. Additionally, it involves overseeing and inspecting programs and policies that guarantee socio-economic development.

2.3.4 Ministry of Gender and Family Promotion, MIGEPROF

The Government of Rwanda has demonstrated strong commitment to promote gender equality and women's empowerment. The Ministry of Gender and Family Promotion is the Central Government institution mandated to ensure strategic coordination of the implementation of national policies, strategies, and programs regarding the promotion of the family, gender, and children's rights' protection to facilitate their integration in the socio-economic and political context of Rwanda.

The ministry has a mission to guarantee secure environment for all family members; empower women and girls; promote non-discrimination, complementarity, and gender equality; design and implement positive masculinity; eradicate gender-based violence; reinforce family unity and positive parenting. It fulfils its mandate through the Directorate of Gender Promotion and Women Empowerment that oversees all interventions and policies related to Gender Equality, Promotion and Women Empowerment; as well as the Directorate of Family Promotion and Child Right Protection which oversees all interventions and policies related to family promotion, child protection, fighting Gender Based Violence (GBV), violence against women and girls, domestic violence and violence against children in all its forms.

The developer must adhere to the ministry's established framework as the proposed project aims to strengthen the abilities of women, promote gender sensitivity, and involve local labor recruitment.

2.3.5 Rwanda Environment Management Authority, REMA

The MoE oversees the Office of the Rwanda Environment Management Authority (REMA), which is the implementing agency of policies and laws related to the environment. REMA coordinates and oversees all aspects of environmental management for sustainable development. It has the role of monitoring the compliance of environmental requirements and development of additional standards.

Therefore, being the organ responsible for regulating and supervising environmental management for sustainable development, its functions include:

- To advise the Government on legislative and other measures for the management of the environment or the implementation of relevant international conventions, treaties, and agreements in the field of environment, as the case may deem necessary.
- To take stock and conduct comprehensive environmental audits and investigations, to prepare and publish biannual reports on the state of natural resources in Rwanda.
- To monitor and supervise impact assessment, environmental audit, strategic environmental assessment, and any other environmental study. REMA may authorize in writing, any other person to analyze and approve these studies.

REMA as the Environmental Authority has the mandate to conduct environmental monitoring to make sure the recommendations of the Environment and Social Impact Assessment study and proposed mitigation measures are implemented.

2.3.6 Rwanda Development Board, RDB

The Rwanda Development Board (RDB) brings together all the government agencies responsible for the entire investor experience under one roof. This includes key agencies responsible for business registration, investment promotion, environmental clearances, privatization, and specialist agencies, which support the priority sectors of ICT and tourism as well as SMEs and human capacity development in the private sector.

In order to facilitate the investment in Rwanda and to ensure that the proposed development strives towards sustainable development, the Department of Investment and division of Investment Promotion of the RDB determines the classification of projects and determines the level of EIA required. RDB coordinates the EIA process and has also power or responsibility to issue EIA Certificate of Authorization and other Environmental Clearance Certificates to projects.

2.3.7 Rwanda Civil Aviation Authority, RCAA

Rwanda Civil Aviation Authority is mandated to regulate and ensure oversight of Aviation Safety, Security, Economic regulation of Air Services and development of Civil Aviation as guided by the provisions of the Convention on International Civil Aviation ICAO DOC 7300. To implement the Government policy of separating operational from regulatory functions, law No 03/2017 of 21/02/2017 was issued; then the law No. 007/2019 of 13/04/2019 was promulgated mandating the RCAA to perform regulatory functions.

The authority aims at developing, implementing, and maintaining a safe, secure, and efficient civil aviation industry in Rwanda. It is in this context that the establishment and operations of the proposed Aircraft hangar and CoE aviation training centre will follow Rwanda civil aviation regulations and technical standards.

2.3.8 Rwanda Utilities Regulatory Authority, RURA

Rwanda Utilities Regulatory Authority (RURA) was initially created by the Law n° 39/2001 of 13 September 2001 with the mission to regulate certain public Utilities, namely: telecommunications network and/or Telecommunications services, electricity, water, removal of waste products from residential or business premises, extraction and distribution of gas and transport of goods and persons. RURA gives it a mandate to ensure that transport services are available throughout the country to meet, in transparency, all reasonable demands of all-natural people and organizations.

RURA regulates public utilities including transportation of goods and persons by different modes of transport. It is the responsibility of RURA to ensure that there is fair competition in the market, enhance the quality of services provided to the consumers and ensure that operators comply with national transport service laws and regulations.

2.3.9 Rwanda Standards Board, RSB

RSB is a public institution established by Rwanda Government Legislation N° 50/2013 of 28/06/2013 determining the mission, organization and functioning of the Rwanda Standards Board to undertake all activities pertaining to the development of Standards, Conformity Assessment and Meteorology services in the country.

RSB publishes standards documents that establish specifications and procedures designed to maximize the reliability of the materials, products, methods, and/or services people use every day. Standards address a range of issues, including but not limited to various processes/systems to help maximize product functionality and compatibility, facilitate interoperability and support consumer safety, trade promotion and

public health. The development and implementation of the proposed project must be in conformity with standards and specifications set by RSB.

2.3.10 Rwanda Energy Group (REG), Water and Sanitation Corporation (WASAC)

The law repealing EWSA Law of 97/2013 of January 31, 2014, paved the way for the creation of two corporate entities, REG and WASAC, which were subsequently incorporated in July 2014 with 100% government shareholding.

Rwanda Energy Group Limited (REG) was incorporated in 2014 to expand, maintain and operate the energy infrastructure in Rwanda through its two subsidiaries, i.e., the Energy Utility Corporation Limited (EUCL) and the Energy Development Corporation Limited (EDCL). The objective of creating these subsidiaries, amongst others, was to ensure focused attention to enhancing efficiency in utility operations on one hand and timelier and cost-efficient implementation of development projects on the other hand. Moreover, the REG holding structure provides the overall coordination and ensures effective development of energy and investment plans.

Water and Sanitation Corporation (WASAC) has the mandate to develop and operate water and sanitation infrastructure and deliver related services in the country. It has the mission to provide quality, reliable and affordable water, and sewerage services through continuous innovations with detailed care to customers' needs.

2.3.11 Aviation Travel Logistics, ATL

Aviation Travel and Logistics Holding Limited is a holding company established by the Government of Rwanda with the mission of managing aviation related activities including travel, logistics, ground, freight, and cargo handling, as well as charter services.

ATL has five subsidiaries that help position Rwanda as a regional aviation hub for tourism, cargo, and logistics-related activities. The subsidiary companies include Rwanda Air Ltd, Rwanda Airports Company Ltd, Akagera Aviation Ltd, Rwanda Tours and Events Ltd and Rwanda Links Logistics Ltd.

2.3.12 Akagera Aviation Ltd

Akagera Aviation Ltd is a subsidiary of ATL and operates from Kigali International Airport in Rwanda. It provides a range of aviation services including charter flights, cargo transportation, aerial surveys, and medical evacuations. Additionally, the company provides pilot training services. The company owns a fleet of helicopters and fixed wing aircraft and has a team of experienced aviation professionals and pilots.

The company is dedicated to delivering dependable, safe, and efficient aviation services to its customers in Rwanda and nearby areas. It aims to build local capacity in the region by selecting qualified personnel.

Moreover, Akagera Aviation Ltd will be the developer of the proposed Aircraft hangar and CoE aviation training centre.

2.3.13 Rwanda Airports Company, RAC

RAC is a subsidiary of "The Aviation, Travel and Logistics Holding Limited", a Holding Group wholly owned by the government of Rwanda. Rwanda Airports Company Ltd has within its purview the daily management, operation, and provision of air navigation services for all airports in the country.

Rwanda Airports Company Ltd is committed to promoting Rwanda's Airports as a prime destination for airlines and diversifying aeronautical and non-aeronautical revenue streams. RAC oversees the airport's commercial activities, including airport concessions and retail businesses, as well as manage air-hub businesses, engineering, and infrastructure development.

Its main responsibilities include the management and monitoring of air space; management of flight, terminal, safety, and airport operations; management of airport's commercial activities, airport concessions and retail businesses; and the management of facilities. The management of Kigali International Airport is in the hands of Rwanda Airports Company Ltd, which means that the planned facilities for Aircraft hangar and CoE aviation training centre will operate in this setting.

2.3.14 RwandAir

RwandAir is the national airline of Rwanda based at the Kigali International Airport. The airline is well regarded for excellent time performance, reaching out to twenty-two cities in Western, Central, Eastern and Southern Africa, the Middle East, Asia, and Europe. RwandAir is one of the fastest growing airlines and operates one of the youngest and state of the art fleet on the African continent. The airline has a mission to provide unsurpassed, safe, and reliable services in air transportation including strategically linking Rwanda with the outside world, while ensuring a fair return on investment

RwandAir receives aviation training from Akagera Aviation Ltd and is poised to gain further benefits from the upcoming Aircraft hangar and CoE aviation training centre project, which aims to enhance the skills of local aviation personnel, cater to the demands of Rwanda and the surrounding region, and thereby facilitate further growth and development for the airline.

2.3.15 Rwanda Air Force

The Rwanda Air Force is one of the services that comprise the RDF. It is a young organization that has been growing operational capabilities since 1996. At its inception the Rwanda Air Force was charged with defending Rwandan Air space, offer intimate support to the Rwandan Army, support related civilian agencies in the airspace management function while at the same time, building a fully-fledged Air Force.

The Rwanda Air Force has been playing complementary roles in special areas like disaster response, firefighting, VIP transportation, rescue, and others. Its objective is to carry out military air operations with professionalism, integrity, and teamwork to advance Rwanda's security interests. The Air Force is divided into five elements: air bases, air defense regiment, security regiment, air support services, and service schools. The fact that the Air Force is currently undergoing aviation training from Akagera Aviation Ltd indicates that there is an existing need for aviation training in Rwanda, and the proposed project will be beneficial to the Rwanda Air Force.

2.3.16 Rwanda Association of Professional Environmental Practitioners, RAPEP

The Rwanda Association of Professional Environmental Practitioners (RAPEP) is a professional association comprising environmental practitioners licensed to operate in the Republic of Rwanda and recorded on its register; and established by Law No 36/2016 of 08/09/2016. The vision of the association is to function efficiently in mobilizing all communities, Government and non-Government entities, to be proactive in reducing environmental vulnerability to various adverse impacts, hazards and provides an effective, coordinated, National post impact response."

2.3.17 Kicukiro district

The district, as other district local governments are responsible for the provision of access to basic services, including roads, water, electricity, sanitation, and solid waste management. Local governments have financial autonomy (fiscal decentralization); own the top center infrastructure; oversee implementation of urban projects; are encouraged to contract private operators for infrastructure O&M; and prepare and implement consolidated district development plans.

2.4 International Standards

2.4.1 African Development Bank (AfDB) Group's Integrated safeguards system: Policy statement and operational safeguard, 2013³⁵

The African Development Bank Group (AfDB) presents its Integrated Safeguards System, a cornerstone of its strategy to promote growth that is socially inclusive and environmentally sustainable. Safeguards are a powerful tool for identifying risks, reducing development costs, and improving project sustainability, thus benefiting affected communities and helping to preserve the environment.

The ISS consists of four interrelated components:

- The Integrated Safeguards Policy Statement: Describes common objectives of the Bank's safeguards and lays out policy principles.
- Operational Safeguards (OSs): Are a set of five safeguard requirements that Bank clients are expected to meet when addressing social and environmental impacts and risks.
- Environmental and Social Assessment Procedures (ESAPs): Provide guidance on the specific procedures that the Bank and its borrowers or clients should follow to ensure that Bank operations meet the requirements of the OSs at each stage of the Bank's project cycle.
- Integrated Environmental and Social Impact Assessment (IESIA): Guidance Notes provide technical guidance to the Bank's borrowers or clients on standards on sector issues, or on methodological approaches clients or borrowers are expected to adopt to meet OS standards.

The ISS is designed to promote the sustainability of project outcomes by protecting the environment and people from the potentially adverse impacts of projects. The safeguards aim to:

- Avoid adverse impacts of projects on the environment and affected people, while maximizing potential development benefits to the extent possible.
- Minimize, mitigate, and/ or compensate for adverse impacts on the environment and affected people when avoidance is not possible.
- Help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

The Bank requires that borrowers/ clients comply with these safeguards' requirements during project preparation and implementation. The Bank has adopted five Oss to achieve the goals and optimal

³⁵https://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/December_2013_-_AfDB%E2%80%99S_Integrated_Safeguards_System_-_Policy_Statement_and_Operational_Safeguards.pdf

functioning of the ISS. The requirements of the following Operational Safeguards should be adopted in the design, implementation and operation of the proposed Aircraft hangar and CoE aviation training centre.

1. Operational Safeguard 1: Environmental and social assessment

The objective of this overarching Operational Safeguard (OS), along with the OSs that support it, is to mainstream environmental and social considerations including those related to climate change vulnerability into Bank operations and thereby contribute to sustainable development in the region.

OS 1 requirements

Project level:

- Borrowers or clients are responsible for conducting the environmental and social assessment (Strategic Environmental and Social Assessment, or SESA, or Environmental and Social Impact Assessment, or ESIA) and for developing, as an integral part of project documentation, an appropriate plan for managing possible impacts.
- Working with Bank operations staff, the borrower or client screens the project for environmental and social impacts—including climate change impacts, potential adaptation and mitigation measures, and the vulnerability of populations and their livelihoods—to determine the specific type and level of environmental and social assessment.
- Environmental and social assessment includes the project's area of influence (both upstream and downstream), a comprehensive scoping of the project's components, consideration of alternatives, and assessment of cumulative impacts, where relevant.
- The project's geographic and temporal area of influence is delineated and explicitly covered in any impact assessment. The area of influence encompasses the following, as appropriate: The area likely to be directly affected by the project; related or associated facilities dependent on the project that are not funded by the project and that would not have been implemented if the project did not exist; areas, including the communities within them, potentially affected by unplanned but technically predictable activities likely to be induced by the project.
- The assessment covers all stages of the project, from construction and operation through to closure/decommissioning.
- In line with any relevant requirements in the Bank's OSs, the assessment considers real alternatives to the project's location and/or design to avoid adverse impacts. It applies the mitigation hierarchy: if avoidance is not possible, reduce and minimize potential adverse impacts; if reduction or minimization is not sufficient, mitigate and/or restore; and as a last resort compensate for and offset.
- To the extent possible, the assessment complies with the relevant legislation and standards applicable in the local jurisdiction, bearing in mind the equivalence of standards with those of the Bank, and it takes into consideration national or regional- level programming documents (i.e., CSP or RISP) that are under implementation or in preparation.

Country systems: The Bank intends that the assessment process will support and strengthen existing country systems for environmental, climate, and social risk management.

Environmental and social assessment: The assessment is conducted according to the principles of proportionality and adaptive management. As needed, the assessment leads to the development of a comprehensive and implementable ESMP with a realistic timeframe, incorporating the necessary

organizational capacity (including further training requirements) and financial resources to address and manage the environmental and social risks that may occur during the full project cycle. When a project component or exact location remains uncertain, an ESMP cannot be developed, but an Environmental and Social Management Framework (ESMF) is developed to guide the identification, preparation, and appraisal of components and activities.

Cultural heritage: The borrower or client is responsible for ensuring that project sites and designs avoid significant damage to cultural heritage, including both tangible and intangible cultural heritage.

Categorization:

Categorization follows the principle of using the appropriate type and level of environmental and social assessment for the type of operation. The following is the categorization of projects as per AfDB.

- Category 1: Bank operations likely to cause significant environmental and social impacts.
- Category 2: Bank operations are likely to cause less adverse environmental and social impacts than Category 1.
- Category 3: Bank operations with negligible adverse environmental and social risks.
- Category 4: Bank operations involving lending to financial intermediaries.

The proposed project falls under category 2:

Category 2 projects are likely to have detrimental site-specific environmental and/or social impacts that are less adverse than those of Category 1 projects. Likely impacts are few in number, site-specific, largely reversible, and readily minimized by applying appropriate management and mitigation measures or incorporating internationally recognized design criteria and standards.

Category 2 projects require an appropriate level of environmental and social assessment (SESA for programme operations, investment plans, and some corporate loans, or ESIA for investment projects) tailored to the expected environmental and social risk so that the borrower can prepare and implement an adequate ESMP (for an investment project) or ESMF (for a programme operation), to manage the environmental and social risks of subprojects in compliance with the Bank's safeguards.

Consultation and participation: The borrower or client is responsible for conducting and providing evidence of meaningful consultation (i.e., consultation that is free, prior and informed) with communities likely to be affected by environmental and social impacts, and with local stakeholders, and also for ensuring broad community support. Category 2 projects, the affected communities and stakeholders are consulted about the draft environmental and social assessment report and the draft ESMP.

Grievance and redress mechanism: The borrower or client establishes a credible, independent, and empowered local grievance and redress mechanism to receive, facilitate and follow up on the resolution of affected people's grievances and concerns about the environmental and social performance of the project.

Implementation of safeguard measures: During project implementation, the borrower or client is responsible for the implementation of the ESMP and reports to the Bank on key management or monitoring tasks set out in the ESMP.

2. Operational Safeguard 3: Biodiversity and ecosystem services

This Operational Safeguard (OS) outlines the requirements for borrowers or clients to (i) identify and implement opportunities to conserve and sustainably use biodiversity and natural habitats, and (ii) observe, implement, and respond to requirements for the conservation and sustainable management of priority ecosystem services.

OS 3 requirements

Environmental and social assessment: As part of the environmental and social assessment, the borrower or client identifies and assesses the potential opportunities for, risks to, and impacts on biological diversity and ecosystem services, including direct, indirect, cumulative and pre-mitigation impacts.

Conservation of habitats and biodiversity: To ensure objectivity and accuracy, the determination as to whether a habitat is natural, modified, or critical is made in consultation with recognized habitat and biodiversity institutions and experts and takes into account designations by national and local authorities. For projects that are being developed in natural habitats, modified habitats with significant conservation value, critical habitats or legally protected areas, the borrower or client incorporates the best available science and engages internationally recognized biodiversity experts in conducting the impact assessment and in developing and implementing mitigation and management strategies.

Invasive alien species: The borrower or client takes precautions to avoid introducing any potentially invasive alien species (that is, species not currently established in the country or region of the project). If invasive alien species already exist in the area, the borrower or client does not undertake activities that may enhance their competitiveness in comparison with native/indigenous species or promote their spread.

Environmental flows: For projects that affect water resources, the borrower or client avoids significantly altering flow regimes in ways that prevent water resources from fulfilling their functions for important upstream and downstream ecosystems and their services to local communities.

Supply chains: If the borrower or client uses external suppliers of living resources but does not have management control over their sourcing and the resources are key to the project's core functions, the borrower or client develops and implements a sustainable resources procurement policy, procedures, and action plan to ensure that: Only resources of a legal and sustainable origin are purchased; The origin of the resources is monitored; The resources do not originate from legally protected areas or internationally recognized areas of high conservation value.

Management of ecosystem services: If during the environmental and social assessment it is determined that the project may affect important ecosystem services, the borrower or client performs an ecosystem services review to identify the risks.

3. Operational Safeguard 4: Pollution prevention and control, hazardous materials, and resource efficiency.

This OS outlines the main pollution prevention and control requirements for borrowers or clients to achieve high-quality environmental performance, and efficient and sustainable use of natural resources, over the life of a project.

OS 4 requirements

Pollution prevention and control, and resource efficiency:

- The borrower or client applies pollution prevention and control measures consistent with national legislation and standards, applicable international conventions, and internationally recognized standards and good practice, particularly the EHS Guidelines.
- The borrower or client includes resource-efficiency and pollution-prevention principles as part of the project policy, in accordance with the principles of cleaner production.
- The borrower or client avoids or, where avoidance is not possible, controls and reduces the generation of pollutants at their source.
- The borrower or client prevents the discharge of pollutants into the air, surface water and groundwater, land, and soil during planned activities as well as unplanned events or emergencies that may result in local, regional, and transboundary impacts. If total prevention is not feasible, the borrower or client takes specific actions to reduce or minimize the effluents or volume of discharges.
- Throughout the different phases of the project's lifecycle—planning and design, construction, commissioning, operations, and decommissioning—the borrower assesses and evaluates resource-efficiency and pollution-prevention techniques and implements them, taking into consideration their technical and financial feasibility and cost-effectiveness.

Waste management: The borrower or client avoids or, where avoidance is not possible, controls and reduces the generation of hazardous and non-hazardous waste at source, in compliance with applicable international conventions. If waste cannot be recovered or reduced, the borrower or client adopts treatment measures and environmentally sound disposal practices.

Hazardous materials management: At the early project stages, the borrower or client determines the potential hazardous materials to be used or generated throughout the lifecycle of the project and considers alternatives that use or generate less hazardous materials. The borrower or client does not manufacture, trade, donate or use any chemicals that are banned or subject to phase-out by international treaties, including ozone-depleting substances and persistent organic pollutants.

Emergency preparedness and response: The borrower or client determines whether the project poses any operational risk of accident or emergency events and assesses the options for responding to such situations. If appropriate, the borrower or client develops an emergency response plan proportionate to the risk of responding to accidents or emergency events that may pose risks to human health and the environment.

Resource efficiency: Borrowers or clients evaluate and, if appropriate, implement financially feasible and cost-effective measures for improving efficiency in the project's consumption of resources such as energy, water, raw materials, and other resources.

Staffing implications: For the appropriate management of all issues related to this OS, the borrower or client has the obligation to have permanent environmental health and safety staff with relevant experience, and a training action plan.

4. Operational Safeguard 5: Labor conditions, health, and safety

This OS outlines the main requirements for borrowers or clients to protect the rights of workers and provide for their basic needs.

OS 5 requirements

Working conditions and management of worker relationship

- When the borrower or client intends to employ a workforce for a project, it develops and implements a human resources policy and procedures appropriate to the nature and size of the project, with the scale of the workforce in alignment with this OS and with applicable national laws.
- The borrower or client provides all employees with documents that contain information on their employment terms, conditions, and rights, including national employment law.
- Migrant workers are employed in accordance with local laws and on comparable terms and conditions as non-migrant workers who are employed in similar work. Where the borrower or other third parties directly or indirectly provide residential or temporary accommodation to workers, facilities shall provide all basic services.
- The borrower or client shall allow workers to form, join, and participate in workers' organizations, such as trade unions or alternative organizations of their own choosing, to express their joint requests and grievances and protect their rights regarding working conditions and terms of employment. The borrower or client shall not seek to exert influence on or try to control these workers' organizations.
- The borrower or client does not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements, including race, gender, nationality, religion or belief, disability, age, sexual orientation, or ethnic, social and indigenous origin.
- The borrower or client takes special measures to address harassment, intimidation, and/or exploitation, especially in relation to women.
- When the borrower or client proposes to implement collective dismissals, it conducts an analysis of alternatives to retrenchment. If the analysis does not identify alternatives to retrenchment, the borrower or client develops and implements a retrenchment plan to mitigate the adverse impacts of retrenchment on workers.

Grievance and redress mechanisms: The borrower or client ensures that a workforce grievance mechanism is permanently available to workers (including workers supplied by third parties) and their organizations to raise reasonable workplace concerns in a transparent manner without fear of retribution.

Protecting the workforce Child labor: The borrower or client does not employ children in any manner that is economically exploitative or is likely to be hazardous or to interfere with the child's education or to be harmful to the child's health or physical, mental, spiritual, moral, or social development as stipulated in national laws in compliance with the provisions of ILO Convention C138 and C182. All work is subject to an appropriate risk assessment and regular monitoring of health, working conditions, and hours of work.

Forced labor: The borrower or client does not employ forced labor—that is, any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty.

Occupational health and safety: The borrower or client provide the workers with a safe and healthy work environment, taking into account risks inherent in the particular sector and specific classes of hazards in the borrower's or client's work areas—including physical, chemical, biological, and radiological hazards.

Table 2:Gap analysis

AfDB Operational standards (OS)	Rwandan National Environmental and Social framework	Additional Requirements stemming from AfDB OS
OS1: Assessment and Management of Environmental and Social Risks and Impacts	<ul style="list-style-type: none"> -Law conserving and promoting environment, N° 48/2018 of 13/08/2018 requires an EIA is prepared for all projects before implementation. -Ministerial order N° 001/2019 of 15/04/2019 indicates a list of activities that must undergo an EIA as well as it reflects ESIA procedure to follow. -Differentiation between full and partial EIA 	<ul style="list-style-type: none"> -ESMPs for every project and activity although not directly required by national legislation. -Associated facilities need to be considered as per the AfDB OS definition. -Cumulative impacts to be considered (specifically during construction). -Social aspects shall be considered during preparation of ESIA. -Management of contractors and development partners as per AfDB.
OS5: Labour and Working Conditions	<ul style="list-style-type: none"> -Rwanda has ratified the Fundamental ILO Conventions. -Law N° 66/2018 of 30/08/2018 regulating Labour in Rwanda -Labour law addresses the following: <ul style="list-style-type: none"> -Prohibits child labour, forced labour and discrimination. -Protection of workers against violation or harassment, freedom of opinion and mentions general guidance on how employment contractual terms are followed and disputes can be resolved -Ministerial order N° 01 of 17/05/2012 on OHS conditions indicates duties of employers and self-employed persons. -Gives powers of an occupational safety and health expert and labour inspector. 	<ul style="list-style-type: none"> -Development and implementation of an overall labour code of conduct. -Development and implementation of written labour management procedures applicable to the Project (this includes a workers' grievance mechanism). -Enforcement and monitoring specifically observed regarding H&S. Common practice at construction sites shows H&S is neglected, e.g., no protective wear (helmets, boots, overalls, gloves), safety equipment is lacking (safety belts on scaffoldings), health of workers (drinking water, site first aid kits or mini clinics) -Development and implementation of H&S plans according to international best practice and industry-specific guidelines.

Aircraft hangar and CoE aviation training center

ESIA

AfDB Operational standards (OS)	Rwandan National Environmental and Social framework	Additional Requirements stemming from AfDB OS
	<ul style="list-style-type: none"> -Gives general provisions of health and hygiene, machinery safety, safety measures like safety signs, fire risk, air, and noise pollution. -Elaborates on workplace welfare, health, and safety -Precaution measures for vulnerable groups. 	
OS4: Resource Efficiency and Pollution Prevention	<ul style="list-style-type: none"> -Law N° 18/2016 of 18/05/2016 governing the preservation of air quality and prevention of air pollution in Rwanda -Law N° 62/2008 of 10/09/2008 Putting in place the use, conservation, protection, and management of water resources regulations -Green Growth and Climate Resilience Strategy 2011 (GGCRS) set out a vision for low carbon growth (low carbon economy by 2050) 	<ul style="list-style-type: none"> -Development and monitoring of specific pollution control management plans (especially for the management of pollution prevention during construction): -Specific waste management plan during construction -Specific wastewater management plan during construction.
OS3: Biodiversity Conservation and Sustainable Management of Living Natural Resources	<ul style="list-style-type: none"> -Law conserving and promoting environment, N° 04/2005 of 08/04/2005 requires the EIA to address the environmental conditions of the Project Area. -Ministerial order N° 007/2008 of 15/08/2008 establishing a list of protected animal and plant species. -Law on management of land, N° 43/2013 of 16/06/2013 classifying protected areas on state land. e.g. National parks. -Ministerial Order N° 007/16.01 of 15/07/2010 on management of land on shores of lakes, rivers -Ministerial Order N° 006/MINIRENA/2015 of 18/06/2015 on management of state protected forests 	<ul style="list-style-type: none"> -Critical habitat screening and assessment. -Biodiversity management for the wetland basin and in case of presence of critical habitat.

Aircraft hangar and CoE aviation training center**ESIA**

AfDB Operational standards (OS)	Rwandan National Environmental and Social framework	Additional Requirements stemming from AfDB OS
	<p>-Law on forest management and utilization N° 47 bis/2013 of 28/06/2013 encourages planting and conservation of forests. It also instructs on how forest clearing licensing is obtained and how forests can be harvested. It gives guidance on management of state, district, and private forests.</p>	

2.4.2 Sustainable Development Goals (SDGs)

The SDGs represent a major step toward improving the effectiveness of national and international development efforts. They provide a way to measure progress in achieving a set of public goods essential to improving the welfare and cohesion of a society.

The proposed construction of an Aircraft hangar and CoE aviation training centre project comes to address some of the 17 goals the world and Rwanda will use over the next years to end extreme poverty, fight inequality and injustice, attain quality education and others. Most of the positive impacts of the project are socio-economic but they cover the three dimensions, social, economic and environment. The development and construction of the facilities will help to stimulate economic growth in Rwanda, the region and on a continental basis.

Among the SDGs to be implemented and achieved:**SDG 1: No Poverty in all its forms everywhere**

By stimulating economic growth and creating job opportunities, the proposed project can help reduce poverty levels in the area.

SDG 4: Quality Education

The training center aspect of the proposed project is aligned with this SDG, which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. By providing training in aviation-related fields, the project will contribute to the development of a skilled workforce and promote access to quality education.

SDG 5: Gender Equality

The construction of an Aircraft hangar and CoE aviation training centre aligns with the SDG of gender equality by ensuring equal access to facilities and opportunities for both men and women, promoting gender diversity in the aviation industry, and supporting the advancement of women in aviation.

SDG 7: Affordable and Clean Energy

The use of solar panels in the operations of the Aircraft hangar and CoE aviation training centre will align with the SDG of affordable and clean energy by promoting renewable energy, providing an affordable source of energy, and setting an example for the aviation industry to follow.

SDG 8: Decent Work and Economic Growth

This goal is relevant for the project as it emphasizes the importance of promoting sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. The construction and operation of the Aircraft hangar and CoE aviation training centre will create job opportunities and promote economic growth in the local community.

SDG 9: Industry, Innovation, and Infrastructure

This goal is particularly relevant for the construction of an Aircraft hangar and CoE aviation training centre as it focuses on building resilient infrastructure, promoting sustainable industrialization, and fostering innovation. This SDG also emphasizes the importance of enhancing scientific research and technological capabilities, which will be relevant for the training center aspect of the project.

SDG 11: Sustainable Cities and Communities

This goal is relevant because the Aircraft hangar and CoE aviation training centre is located in an urban area. SDG 11 aims to make cities and human settlements inclusive, safe, resilient, sustainable and reduce the environmental impacts of cities.

SDG 13: Take urgent action to combat climate change and its impacts.

To align the construction and operation of an Aircraft hangar and CoE aviation training centre with SDG 13, sustainable practices will be implemented. These include energy-efficient design, use of renewable energy sources, sustainable materials, waste reduction and management, sustainable transportation, and greenhouse gas emission reduction. Incorporating these practices will help combat climate change and its impacts.

SDG 17: Partnerships for the Goals

The proposed project will promote partnerships between the public and private sectors and encourage international cooperation towards achieving sustainable development.

The proposed Aviation hangar and academy training center project will contribute towards sustainable development by establishing a Centre of Excellence for Aviation Skills (CEAS). The ESIA study will ensure that the proposed project reflects Environmental Sustainability especially during the time of planning, construction, and operation.

2.4.3 Regional and international Agreements

Rwanda has signed and/or ratified several international agreements and conventions relating to the environment both at regional and global level such as ones below. However, due to the low environmental sensitivity of the project site no impact associated with these conventions are anticipated as shown below:

- EAC Protocol on Environment and Natural Resources Management, 2006. Article 3 of this Protocol states that “it is a protocol of general application and shall apply to all activities, matters and areas of management of the environment and natural resources of the Partner States, including environmental impact assessment and environmental audits”.
- The EAC Regional Environment Impact Assessment Guidelines for shared ecosystems, 2005.
- The international Convention on Biological diversity and its habitat signed in Rio De Janeiro in Brazil on 5 June 1992, as approved by Presidential Order No 017/01 of 18 March 1995.
- The United Nations Framework Convention on Climate Change (UNFCCC), signed in Rio De Janeiro in Brazil on 5 June 1992, as approved by Presidential Order No 021/01 of 30 May 1995.
- The Kyoto Protocol to the framework on climate change adopted at Kyoto on March 6, 1998, as authorized to be ratified by Law No 36/2003 of December 2003.
- The Stockholm Convention on Persistent Organic Pollutants, signed in Stockholm on 22 May 2001, as approved by Presidential Order No 78/01 of 8 July 2002.
- United Nations Convention to Combat against Desertification (UNCCD).
- Vienna Convention for the Protection of the Ozone Layer, the Montreal Protocol on Substances that Deplete the Ozone Layer and the Amendments to the Montreal Protocol.
- Convention on the Conservation of Migratory animals’ wildlife and the Convention on International Trade in Endangered Species of wild flora and fauna threatened with extinction.
- IATA standards
- ICAO – safety and environmental requirements.
- The Chicago Convention on International Civil Aviation, signed on 7th December 1944. This landmark agreement established the core principles permitting international transport by air, and

led to the creation of the specialized agency which has overseen it ever since – the International Civil Aviation Organization (ICAO).

- The Montreal Convention, signed on 28th May 1999. It establishes airline liability in the case of death or injury to passengers, as well as in cases of delay, damage or loss of baggage and cargo.
- Tokyo Convention on Offences and Certain Other Acts Committed on Board Aircraft, 1993.

The foregoing notwithstanding, the developer and contractor will have a contractual obligation to avoid impacts that may violate above conventions, wherever encountered.

3.0 PROJECT DESCRIPTION

This section provides a description of the project in terms of location, facilities and associated project infrastructure and activities during the project lifecycle that will facilitate a comprehensive identification of the potential impacts on resources and receptors that could result from project activities during pre-construction, construction, operation, and decommissioning stages.

3.1 Description of the developer

Akagera Aviation is a Rwandan aviation company located at Kigali International Airport in Rwanda. Their primary objective is to establish a top-notch aviation training center in Rwanda that will not only benefit the country but the surrounding region and beyond. They also aim to maximize their shareholders' return on investment as a private organization. Since their establishment in 2004, they have been focused on promoting career development in aviation by providing the necessary training to become a helicopter or fixed-wing pilot with a PPL or CPL license, enabling individuals to fly anywhere globally. Their vision is to become the go-to Center of Excellence in aviation in East and Central Africa, and their mission is to lead the aviation industry's growth in Rwanda and the region. To achieve this, they have a five-year Feasibility Study plan that outlines their objectives and measures their progress using available resources and other financial sources.

3.2 Description of the Project Overview

The Government of Rwanda considers the transportation sector to be a significant driver of economic growth. To attract both domestic and foreign investment in the country, it recognizes the importance of enhancing the quality and dependability of transport services while reducing costs. To this end, the government has implemented a comprehensive investment plan and capacity building program that includes expanding Kigali International Airport and other domestic airports, establishing an aviation training school, providing navigational services, constructing a new international airport, and supporting the growth of the national carrier, RwandAir.

It is in this context that Akagera Aviation Limited (developer) intends to construct an Aircraft hangar capable of accommodating 8 Beechcraft King air size aircraft at the Kigali International Airport. Additionally, they propose the creation of a CoE aviation training center to serve up to 490 students. The academy will offer different departments such as Pilot training, Maintenance training, Cabin crew, Dispatch, Ancillary courses, Air Traffic Management Courses, Aeronautical information services, Aeronautical meteorological services, Aeronautical communications operations, Communication Navigation and Surveillance, Airport Emergency Services (Operations), and other supporting programs. The academy will partner with Coventry University to offer various courses such as Aviation Management BSc (Hons), Human Factors in Aviation MSc, Air Transport Management MSc, Aerospace Technology BEng (Hons), Aerospace Engineering MSc, Aerospace Systems Engineering MEng/BEng (Hons), and Mechanical Engineering MEng/BEng (Hons).

Given the increasing importance of drones in Rwanda, the aviation academy will also provide drone piloting training along with other pilot training such as Basic commercial training, advanced training for specialized missions, Private Pilot License classroom (PPL), Commercial Pilot License classroom (CPL), and Airline Transport Pilot License (ATPL/MPL).

3.3 Background and Justification of the project

African aviation market is the one with the most potential for growth. This is due to its emerging industrial sector and its potential for serving a large and developing population.

The economic activity of the continent is improving but is still catching up to other regions of the world. Air transport supports 6.2 million jobs and USD 55.8 billion in GDP in Africa. The aviation sector in Africa directly employed over 415,000 people in 2016. Current projections indicate the number of passengers will double between now and 2036. Based on the regional and global projections for pilots, maintenance personnel, and air traffic controllers, this growth will create shortages of skilled personnel.

Africa's economy is predicted to grow rapidly like Asia-Pacific over the longer term. Contribution to aviation market growth will be the increasing population causing urbanization, the demand for natural resources will bring business, wealth and a growing middle class. Inbound tourism to Africa is expected to grow from 50 to 134 million annual international tourist arrivals. African air traffic is forecast to grow at an average rate of 6.2%, with international flights forecast to grow at 5.6%. The number of passengers traveling by air in Africa has grown at a rate of 7.8% on average, every year between 2002 and 2012. Passenger numbers on Intra-Africa routes have grown at a higher rate, 9.4% on average every year during the same period.

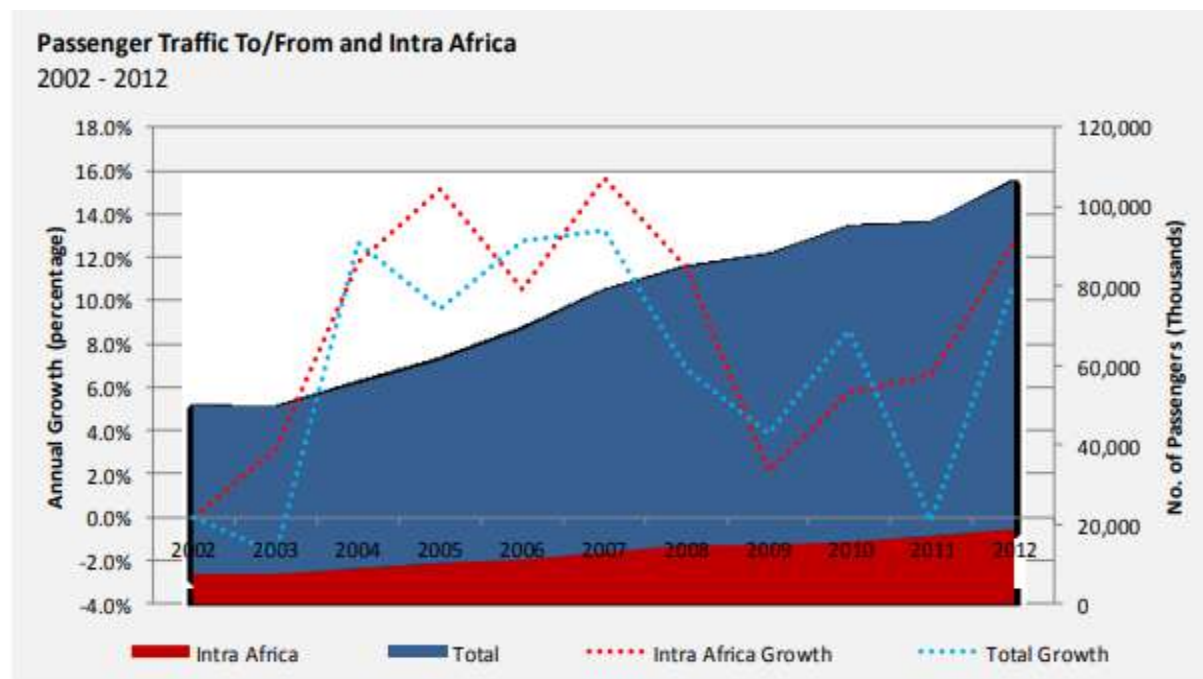


Figure 1: Passenger Traffic inter and intra Africa.³⁶

According to ICAO the number of passengers will increase to 122.2 million in 2017 and 348 million by 2032. This represents an average growth of 7.2% per annum. African airlines will need to increase aircraft utilization and movements to support this level of growth. The current fleet size will not be able to meet the demands and airlines will need to add more aircraft.

³⁶ Akagera Aviation Ltd, Business Plan, June 2015.

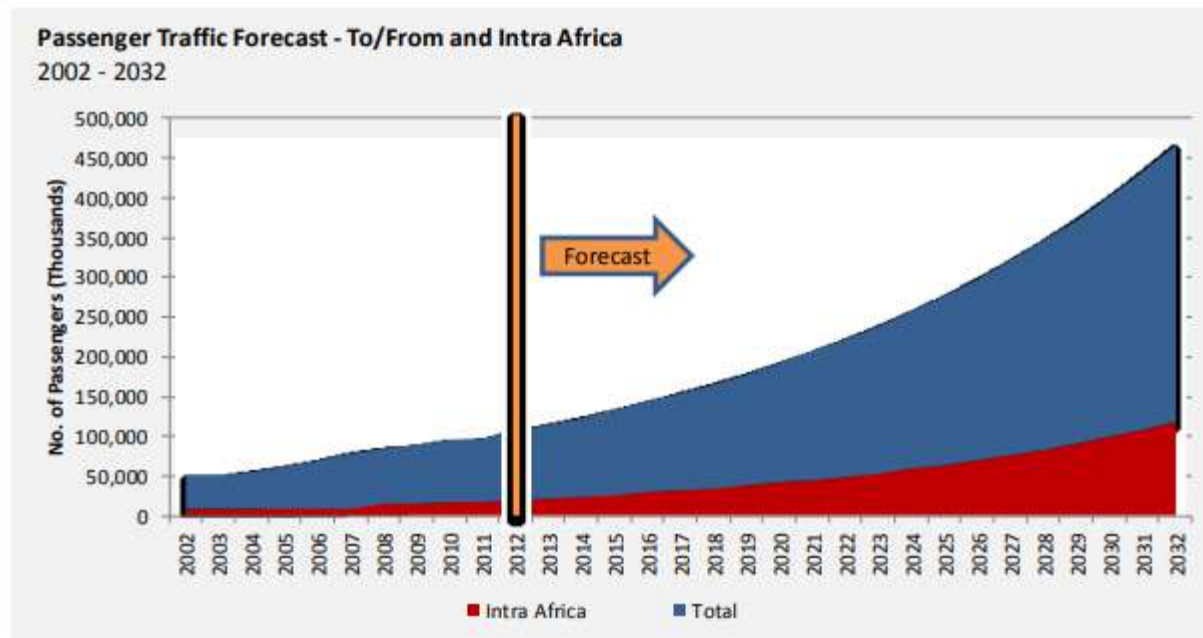


Figure 2: Passenger Traffic Forecast inter and intra Africa.³⁷

The airline industry within Africa generally and East Africa specifically has grown with tremendous pace over the past few years. Mainly due to liberalization in aviation regulations; airports in countries such as Kenya, Ethiopia, Rwanda, Nigeria, Senegal, and South Africa have been developed into regional hubs. Nearly all countries within Africa are investing in projects to improve airport infrastructure and relating industries to benefit from this heightened activity and economic prosperity it is likely to bring.

The Rwandan air transport is experiencing rapid growth, the air transport industry is a vital engine of global socio-economic growth. It is of vital importance for economic development, creating direct and indirect employment, supporting tourism and local businesses, and stimulating foreign investment and international trade. Economic growth, technological change, market liberalization, the growth of low-cost carriers, airport congestion, oil prices and other trends affect commercial aviation throughout the world. The Rwanda air transport industry's mission is to become a Centre of Excellence in aviation in Africa and to spearhead aviation industry development East Africa and Central Africa and Globally

The aviation industry is expanding and will require more skilled personnel to operate effectively. Therefore, Akagera Aviation Ltd intends to build a CoE aviation training center that will offer various courses to serve the needs of both local and international aviation industries.

Regarding the proposed aircraft hangar, there is a growing demand for affordable and quality aircraft hangar buildings in the region. While constructing new buildings is an option, it can be expensive and time-consuming. Therefore, there is a need to provide more accessible and affordable options.

³⁷ Akagera Aviation Ltd, Business Plan, June 2015.

3.4 Current situation at the proposed hangar site

Kigali International Airport has been recognized as one of the top ten best airports in Africa based on customer feedback. The airport has undergone extensive renovations, costing over \$30 million, including the addition of a new apron, three taxiways, and a hangar. The airport has also implemented advanced technologies such as the Bird Avoidance System and weather observing systems to enhance safety and efficiency.

The proposed Aircraft hangar and CoE aviation training center will be located in the Kicukiro District of Kigali, which has easy access to the airport via a well-developed tarmac road KN5. The area around the airport is well-developed. The airport is comprised of existing facilities such as a runway, passenger terminal, cargo terminal, and waste management. The site also has utilities, a weather station, an electricity substation, and a fiber optic line. The proposed project will be situated at a distance of 189 meters from the centerline of the runway. Weather instruments located in close proximity to the proposed hangar site at KIA consist of devices that measure various meteorological parameters. These include instruments to monitor wind speed and direction, temperature, humidity, precipitation, present weather conditions, visibility, cloud cover, and atmospheric pressure.

The following diagrams depict the various facilities that are present within the Kigali International Airport.





Figure 3: Some of the utilities existing at the KIA.

The connection between the proposed aircraft hangar and Kigali International Airport.

The proposed project components will be connected to various existing facilities at the Kigali international airport. These facilities include the existing runway, which is a designated strip of land used for takeoff and landing of aircraft. The existing apron is also an important facility that serves as the area where aircraft are parked, refueled, and boarded. In addition, the existing stormwater drainage system is responsible for collecting and draining excess rainwater from the airport, ensuring that it does not interfere with the airport's operations.

Other existing facilities to which the proposed project components will connect include the Akagera aviation offices, which serve as administrative and operational facilities. Furthermore, the project will rely on the existing power and water connections as well as water tanks to provide electricity and water needed for the airport's operations. Finally, the existing fuel tanks will be utilized to store fuel for the aircraft, ensuring a constant supply of fuel for the airport's operations.

The following are some infrastructures of KIA that will be used by the proposed hangar.

Airstrip (Runway): During the operational phase, Kigali International airport's current runway will be utilized for training exercises. The runway's condition, surface, strength, and parking area are in good shape. The lighting and markings are easily visible. They have completed both the expansion and rehabilitation of the runway, and the taxi and parking areas are able to accommodate up to five different aircraft types. Additionally, fuel and unloading access is readily available.

Runway details

- Runway Dimensions: 3,500 m X 60 m
- Orientation: 10/28,
- Surface: All weather asphalt to ICAO standards.
- Runways with an Instrument Approach: KGL Airport
- Latitude: -1.96589994430; -1.97134995460

- Longitude: 30.123899459838; 30.155000686645
- Runway True Alignment: 100 280

Fueling area: Typically, aircraft fueling takes place at the runway facilities, but sometimes these tanks might be situated near the overhaul operations. When fueling is carried out on the runway as part of standard procedure, the onsite fire department will be present to monitor the process. Any fire that involves flammable or combustible liquids can cause significant harm. Therefore, locations that have Jet-A fuel tanks must be pre-planned accordingly to ensure proper safety measures.

Apron: The aircraft parking area is where loading and unloading of goods takes place and is situated close to the terminal building. The apron's size is designed in a way that it has appropriate drainage systems and ample space for the aircraft to maneuver around each other. The current apron will be utilized for hangar operations.

Control tower: The control tower oversees and regulates the entry and departure of aircraft. During the landing and takeoff, the control tower communicates with the pilots to prevent any potential collisions and ensure safe operation. The current control tower will be utilized for hangar operations to monitor the aircraft.

High-speed Taxiway: The taxiway is a route that links the different areas of an airport, such as the runway, terminal, apron, and hangar. It is made of the same materials as the runway, either asphalt or concrete. At KIA, the current taxiway will be used for the aircraft hangar project.

Helicopter Stand: The hangar project will use the existing stand of KIA for helicopter landing.

Fire Station: The current fire station is outfitted with a fire protection system to detect and prevent fire accidents as soon as possible. During the implementation and operation of the aircraft hangar, the existing fire station at KIA will be utilized.

Storm water drainage channels: The proposed aircraft hangar structure's finished floor and the surrounding surfaces must have a gradient that allows for water to flow positively into the existing airport storm sewer system. In areas where there is no storm sewer system available, the airport manager may request the installation of inlets and pipes designed to handle the maximum anticipated flow and loading, which will be connected to the existing storm sewer system.

3.5 Project objectives

The Rwandan air transport is experiencing rapid growth, the air transport industry is a vital engine of global socio-economic growth. It is of vital importance for economic development, creating direct and indirect employment, supporting tourism and local businesses, and stimulating foreign investment and international trade. Economic growth, technological change, market liberalization, the growth of low-cost carriers, airport congestion, oil prices and other trends affect commercial aviation throughout the world.

The Rwanda air transport industry's mission is to become a Centre of Excellence in aviation in Africa and to spearhead aviation industry development in East Africa and Central Africa and Globally.

The objective of the aviation academy training center is to empower the labor force in the aviation industry by providing qualifications in the aviation field not only in Rwanda but also in the region and beyond.

To achieve that, the client has initiated the project of training together with administrative facilities for the aviation academy without forgetting the need for conferences, libraries, recreation, and accommodation.

The proposed CoE aviation training center is composed of different department:

- Pilot training
- Maintenance training, Cabin crew, Dispatch, Ancillary courses
- Air Traffic Management Courses
- Aeronautical information services
- Aeronautical meteorological services
- Aeronautical communications operations
- Communication Navigation and Surveillance
- Airport Emergency Services (Operations) and other supporting programs

The objective of the proposed hangar is to provide shelter for fixed wings and rotary wing aircraft, maintenance/engineering and other technical aircraft activities.

3.6 Project cost & staffing

Cost estimation involves predicting the financial and other resources required to complete a project within a defined scope. This includes accounting for all necessary elements such as materials and labor, to calculate a total investment amount which determines the project budget. Engineers' estimates are used to determine the financial resources needed for the project. If the cost estimate is too low, the project may not have enough funds and could stall or have a reduced scope.

The project's total cost amounts to \$53.5 million USD, divided into infrastructure and equipment expenses of \$29.1 million USD and \$24.4 million USD, respectively. Phase 1 is projected to consume \$27,890,240.25 USD, comprising \$18,390,240.25 USD for infrastructure and \$9,500,000.00 USD for equipment. In Phase 2, an estimated total of \$25,344,519.42 USD will be spent, with \$10,444,519.42 USD allocated for infrastructure and \$14,900,000.00 USD for equipment.

To ensure the success of the proposed project during its construction and operation, a workforce will be required. The estimated number of workers needed during the 24-month construction phase is up to 1000 individuals. The labor force will comprise of unskilled workers from local communities who will perform general work, as well as skilled laborers who are either locally sourced or imported from foreign countries.

There are a total of 318 construction workers who will be hired during the construction of the aircraft hangar, as well as a total of 682 construction workers who will be hired during the construction of the CoE aviation training center.

During the operational phase of the hangar and aviation training center, a total of 98 individuals will be hired.

3.7 Project phasing and activities

The project activities during all phases (design, implementation, operation, decommissioning) are characterized by the following phases:

Preconstruction phase:

- Reconnaissance of the project site.
- Identification of alternative sites.
- Pre-feasibility and feasibility studies of the chosen construction site.

Construction phase: It is estimated that the construction will take a period of 24 months. Construction of the Aircraft hangar and CoE aviation training center will involve:

- Site fencing and managing site access and contact points.
- Land clearing.
- Excavation.
- Foundation works.
- Leveling, and finishing.
- Installation of plumbing and electrical fixtures.
- Soil preservation.
- Pollution generation control and management during construction works.

Operation phase:

The use of the Aircraft hangar and CoE aviation training center facilities.

Aircraft hangar operation activities:

- Aircraft storage
- Maintenance and repair
- Overhaul and refurbishment
- Modification and customization
- Cleaning and detailing
- Testing and inspection
- Training such as simulation exercises or safety drills, for pilots and maintenance personnel.

Aviation training center operation activities:

- Classroom instruction
- Flight training
- Simulator training
- Ground school training
- Certification courses
- Safety training
- Use of the hostel and recreation facilities

Decommissioning phase:

- Demolition of the Aircraft hangar and CoE aviation training center facilities and management of debris formed during breakdown of the units.
- Reuse of other construction materials without carelessly disposing of them.

3.8 Project components

The proposed project will be comprised of an Aircraft hangar capable of accommodating 8 Beechcraft King air size aircraft at the Kigali International Airport, as well as CoE aviation training center to serve up to 490 students.

3.8.1 Aircraft hangar

The proposed aircraft hangar will occupy an area of 12,700 sqm, with a capacity of accommodating 8 aircraft, located 189 m from the runway centerline. The site plan of the hangar provides for the following areas:

- The hangar
- Offices
- Apron
- Taxi ways that connect the hangar to the existing runway.



Figure 4: Site masterplan of the proposed aircraft hangar



Figure 5: Top view of the aircraft hangar.



Figure 6: Perspective view of the aircraft hangar.



Figure 7: Design concept of the inside of the aircraft hangar

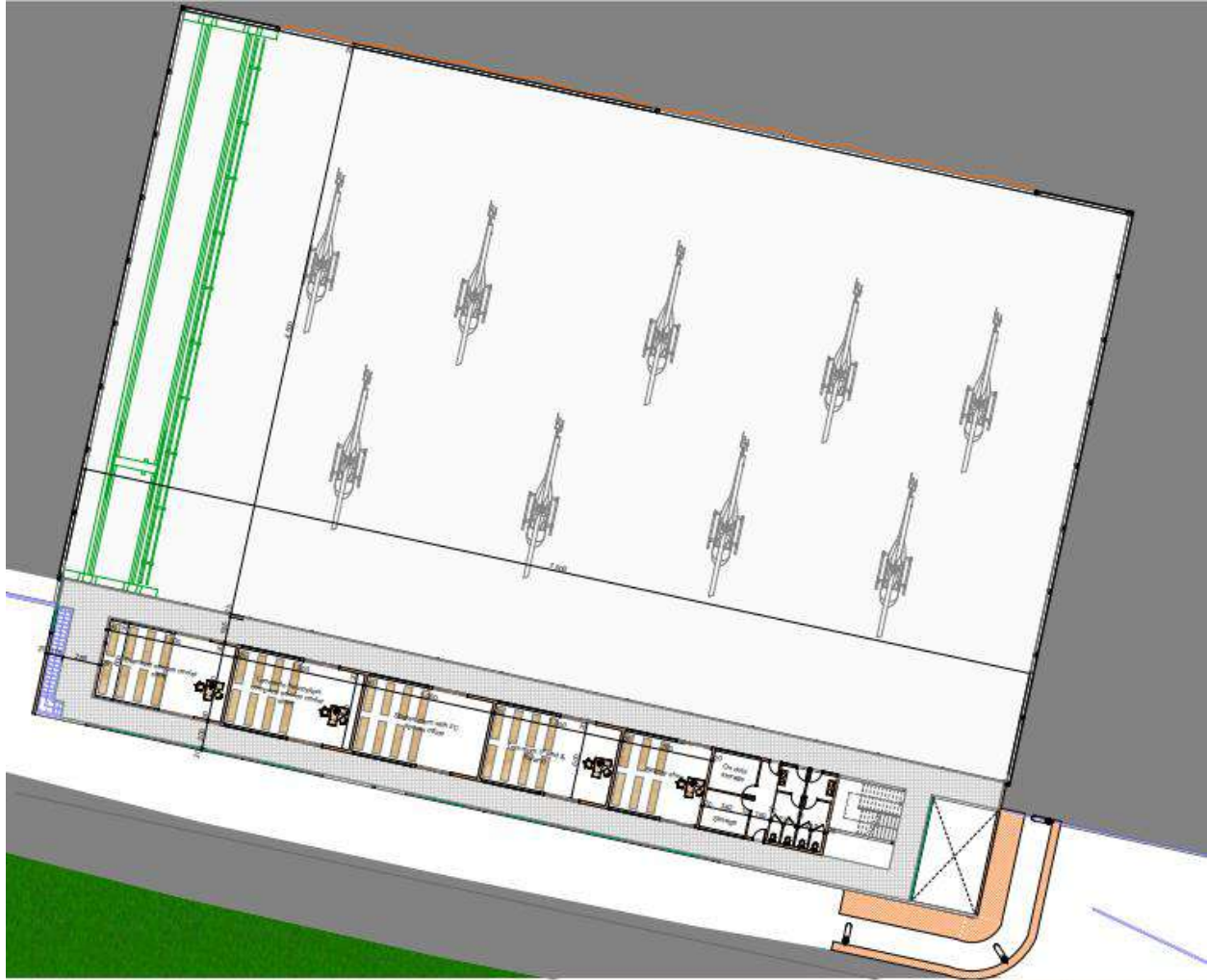


Figure 8: Floor layout of the aircraft hangar

Office layout of the hangar floor level will be comprised of:

- Diamond service center store
- Leonardo helicopters company service center store
- Spare room with I/C spares office
- Tool room (fixed & rotary)
- Battery shop
- Storage rooms

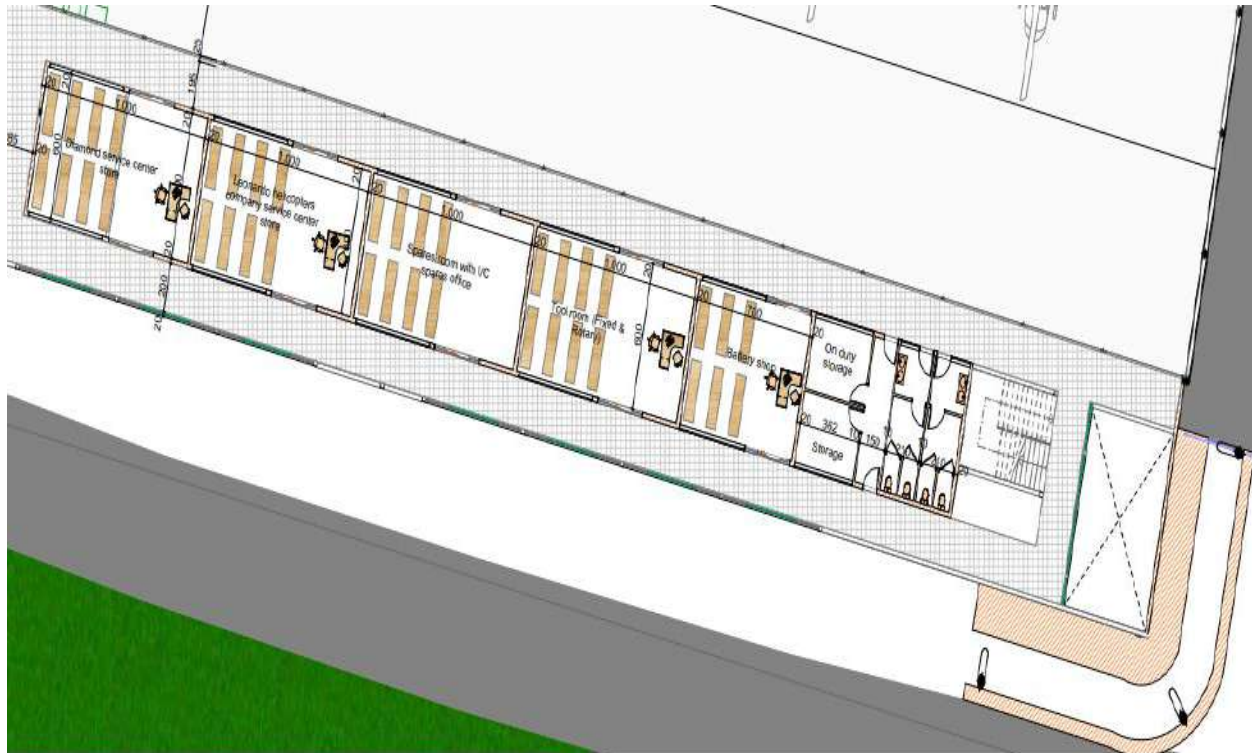


Figure 9: Office layout of the aircraft hangar floor level

Office layout of the basement floor level will be comprised of:

- Generator room
- Air compressor room
- Technical library
- Meeting room
- Chief engineers & engineers office
- Quarantines store
- Changing room
- Customer/ hospitality service desk
- Pantry

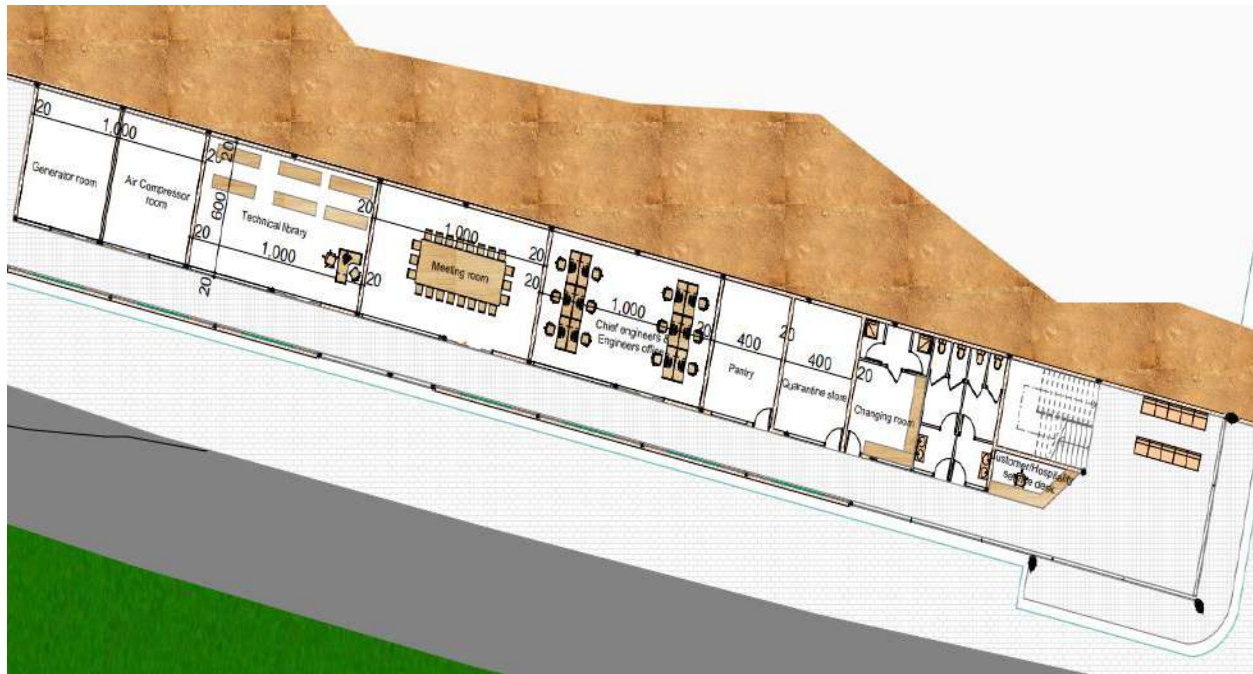


Figure 10: Office layout of the basement floor level

3.8.2 CoE aviation training center

The training center will train in the following different departments:

- Maintenance training, Cabin crew, Dispatch and Ancillary courses for 150 students
- Pilot training for 90 students
- Air Traffic Management Courses for 50 students
- Aeronautical information service for 50 students
- Aeronautical meteorological services for 25 students
- Aeronautical communications operations for 50 students
- Communication Navigation and Surveillance for 25 students
- Airport Emergency Services (Operations) for 50 students
- Other supporting programs.

The proposed CoE aviation training center site plan will be comprised mainly of:

- Academic block of 8 levels and another academic block 2 for future expansion
- Hostels of G+2
- Gym, changing room, and staff quarters of G+1
- Recreation areas such as swimming pool and basketball pitch



Figure 11: Academic block site layout

3.8.2.1 Academic block



Figure 12: Perspective view of the academic block

Ground floor components:

- Simulator rooms & Tecam (2)
- Simulator briefing rooms (2)
- Simulator technician rooms (2)
- First aid rooms
- Analog electronics lab
- Aircraft instruments lab
- Power plant workshop
- Air compressor room
- Tools room
- General workshop
- Security check point, entry lobby
- Reception area and waiting room.
- Kitchen
- Utility rooms & toilets

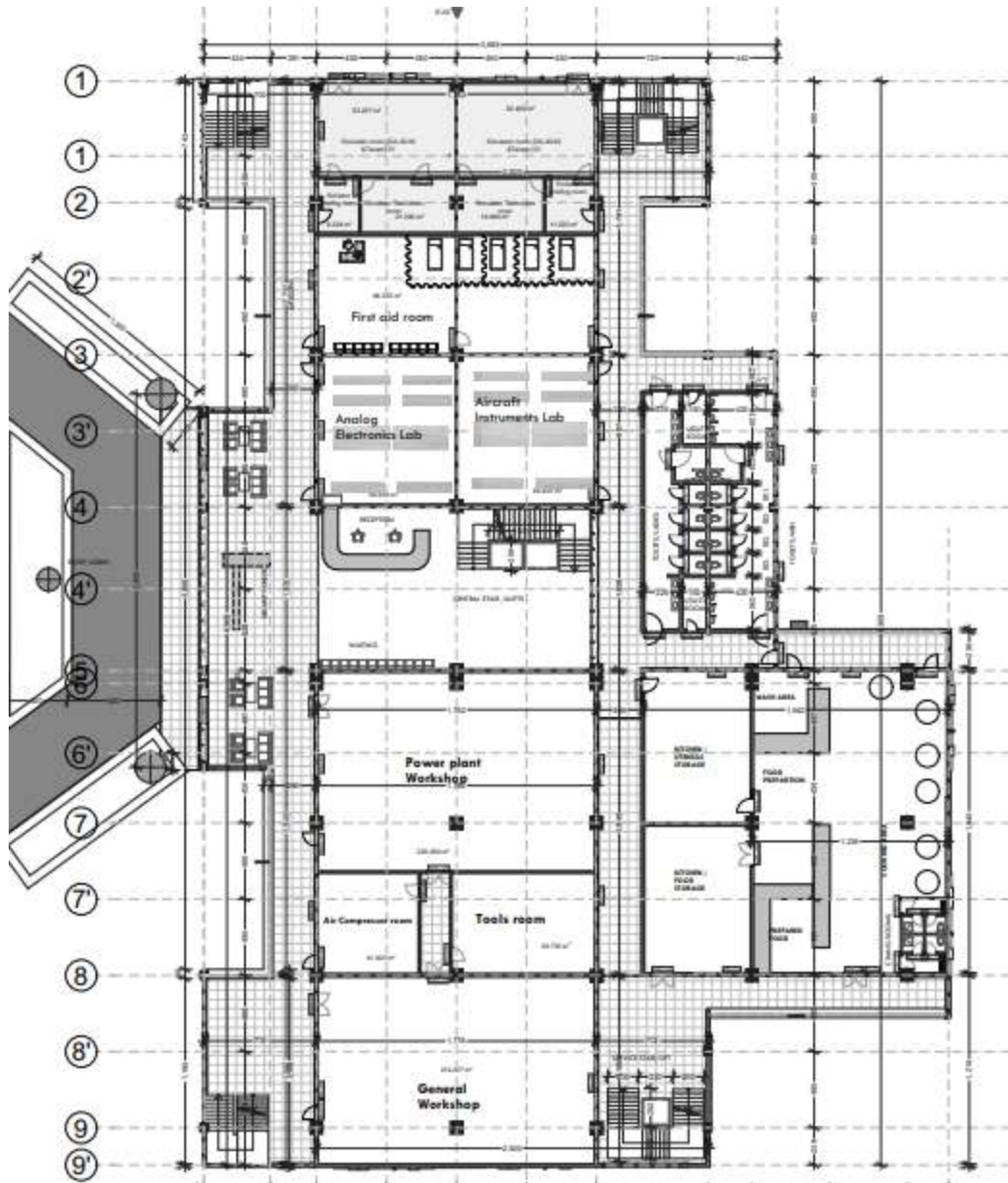


Figure 13: Ground floor layout of the academic block

First floor components:

- Head of training office (maintenance)
- Conference room
- Offices (8)
- Classrooms (5 (M), 3 (P))
- Computer based training room.
- Exam room
- Crew room/waiting room/briefing room.
- Digital electronics lab
- Utility rooms and toilets

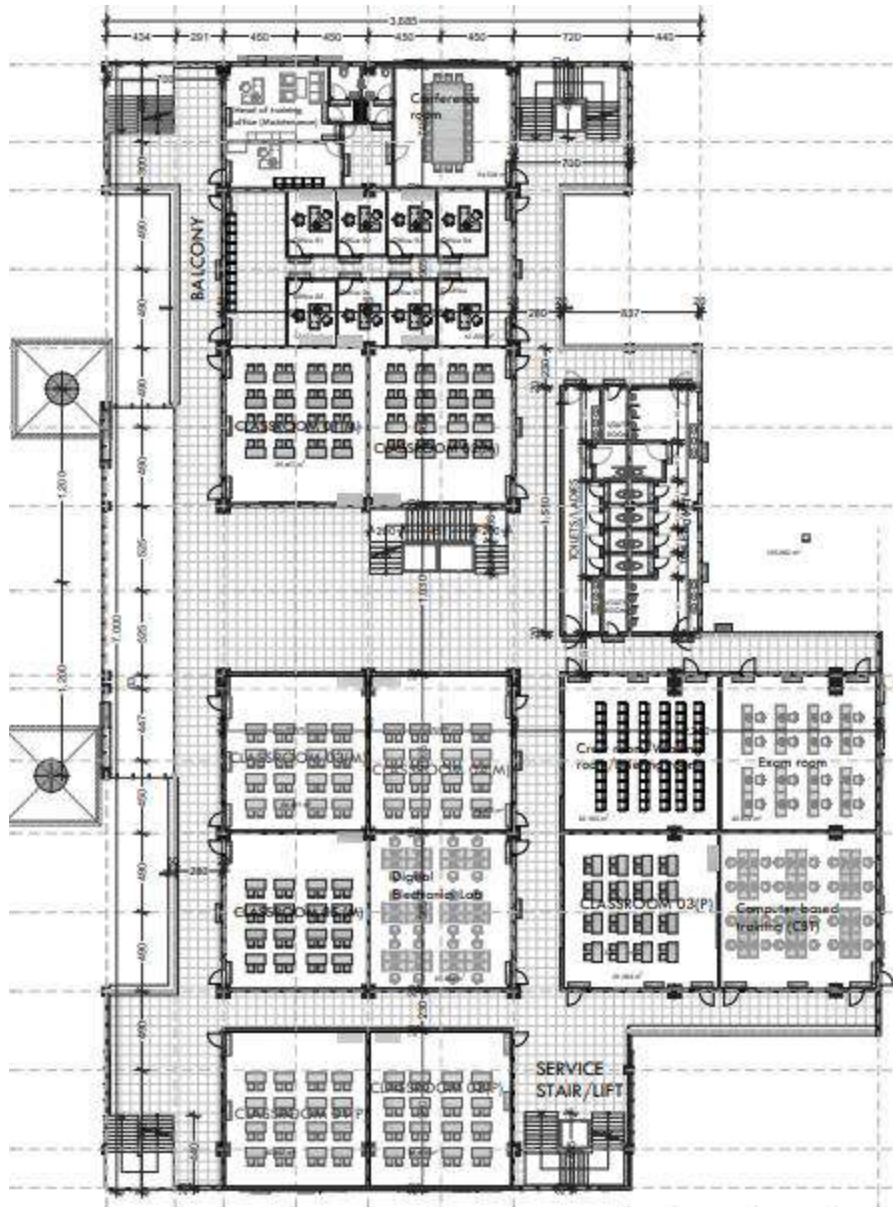


Figure 14: First floor layout of the academic block

Second floor components:

- MD & assistant offices
- Offices (12)
- Conference room
- Pre & post flight briefing rooms.
- Operation room
- Business development & staff office
- Head of training office
- Finance/cashier/accountant office
- Logistics manager & staff office
- Archive/ server rooms

- Chief flight instructor office
- IT office/ technician room
- HRM & staff office
- Internal auditor office
- Admin in charge of student's records office.
- Cafeteria
- Control room
- Quality manager & staff office
- Safety manager & staff office
- Utility rooms & toilets

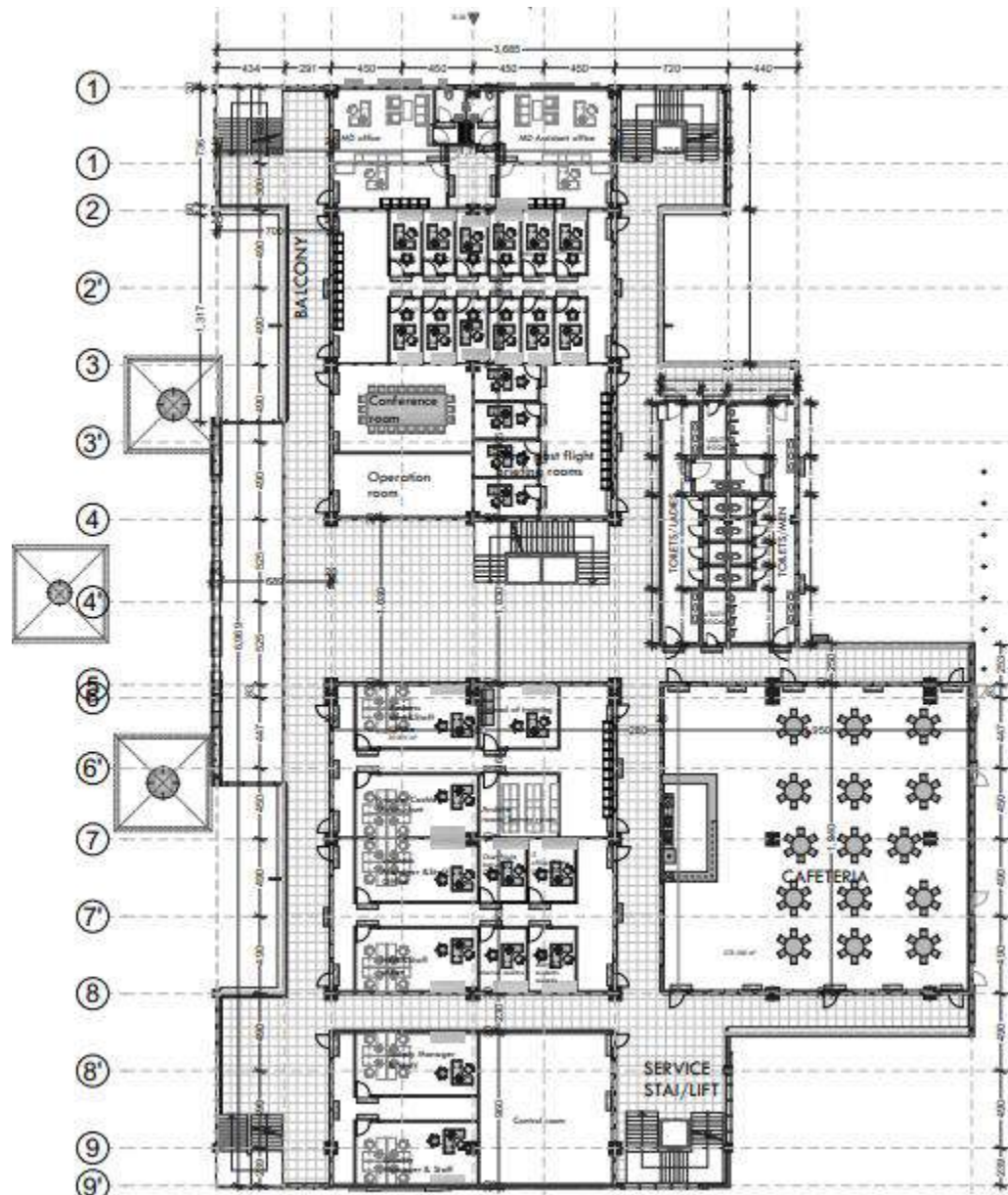


Figure 15: Second floor layout of the academic block

Third floor components:

- Principal & assistant offices
- Registrar & assistant offices
- Meeting room
- DAF office
- Accounting office
- Archive room
- Training Coord
- Secretariat office
- Reg & archiving office
- Reception
- Quality M. office
- Instruct serv. M office.
- Flight OP & maintenance Office
- Chief air. OP office
- Instructors air. OP
- Instructor ATM office
- Instructor CNS office
- Chief ATM
- Chief CNS
- Utility rooms and toilets
- Chief exam
- Evaluators/ examiner rooms
- PPL, CPL, & ATPL classroom
- Drone piloting training cage
- Chief AIM
- Chief AV. Sec
- Instructors AIM
- Instructors' aviation security

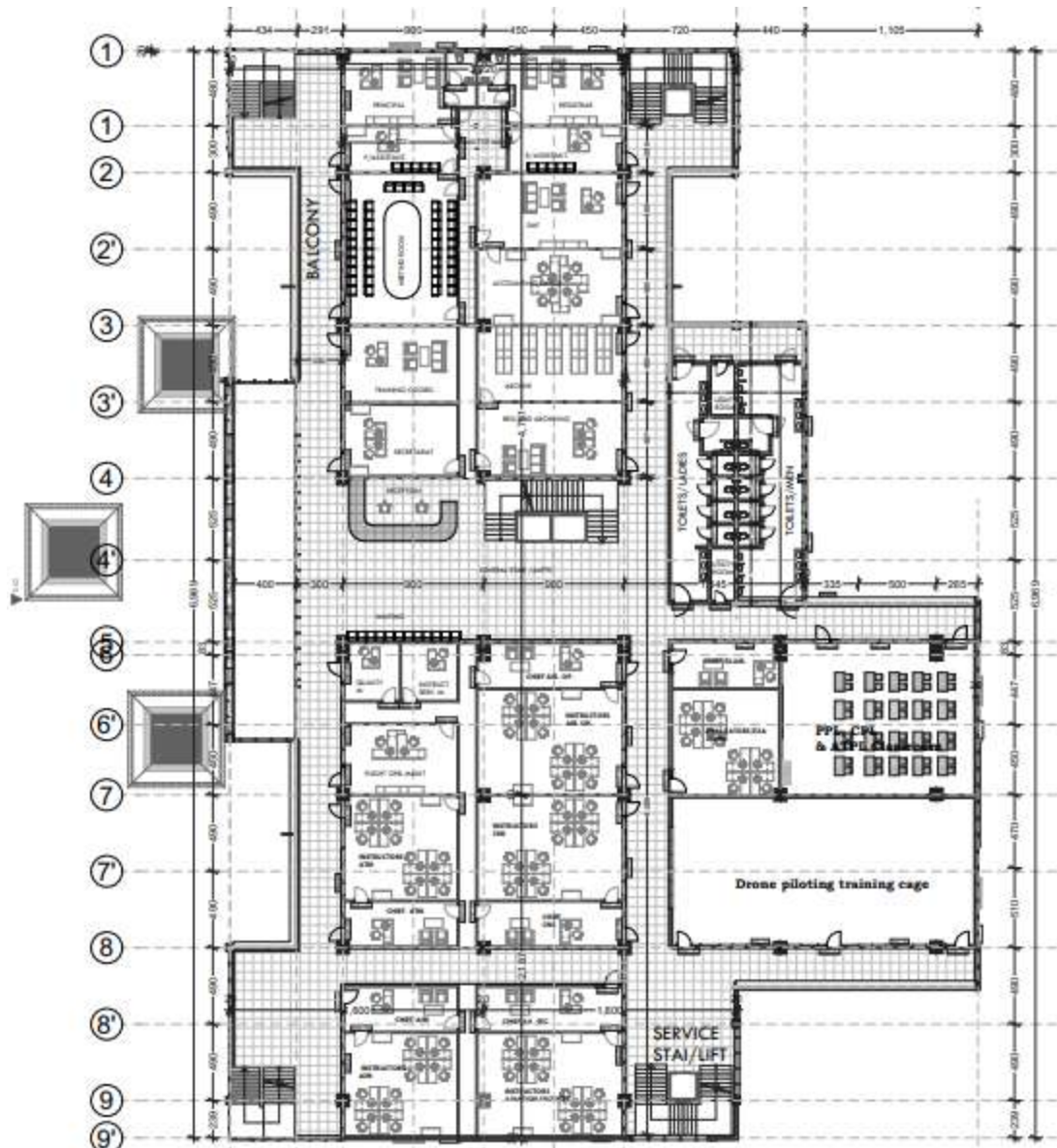


Figure 16: Third floor layout of the academic block

Fourth floor components:

- Area radar room
- 2D simulation rooms (7)
- Area airways control (Non radar)
- Approach radar control
- Approach control (non-radar)
- Aerodrome control course
- Apron management & ground operations
- Area radar conversion
- Basic aerodrome
- Search & rescue (big room for plotting)
- Utility rooms and toilets

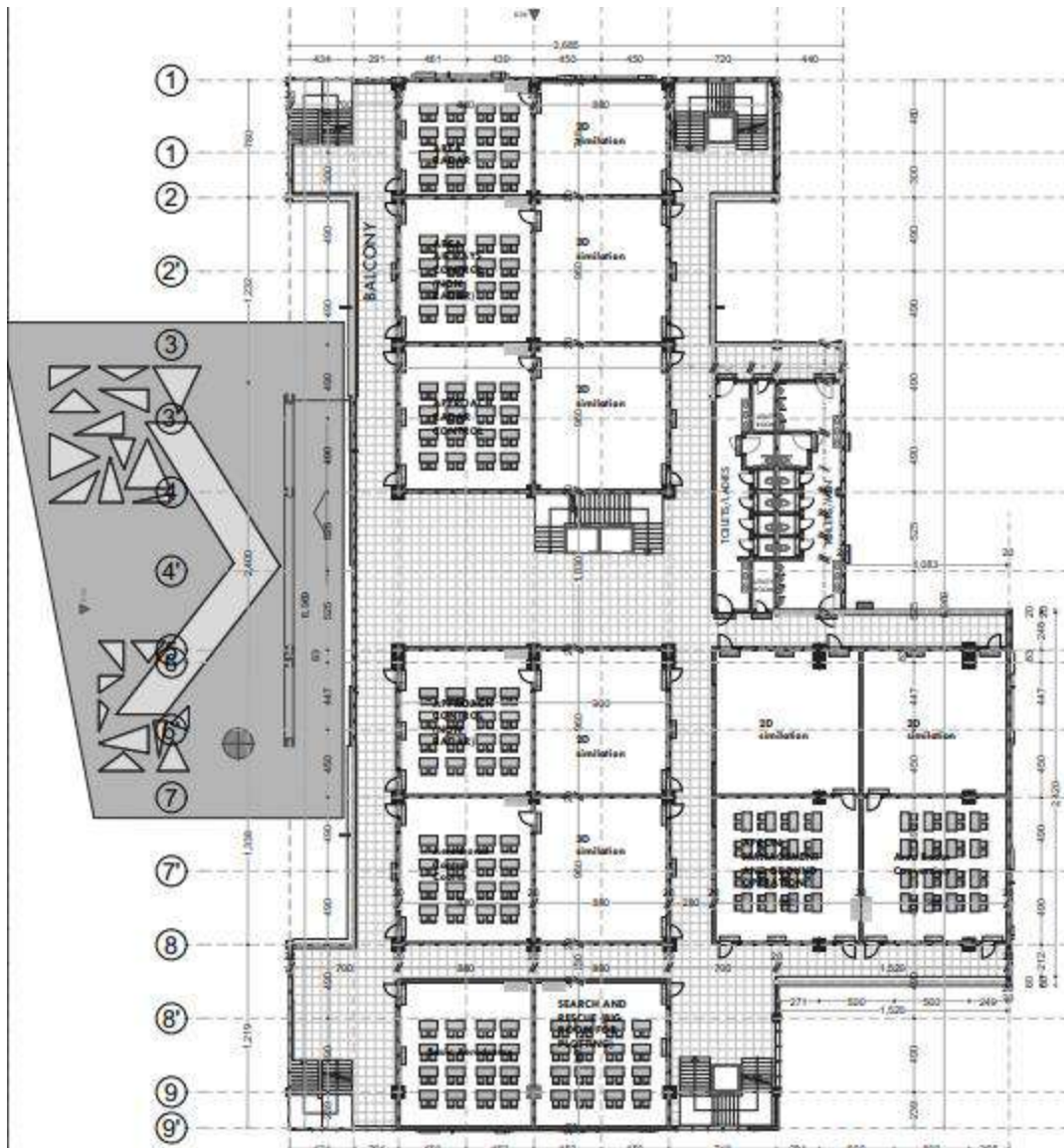


Figure 17: Fourth floor layout of the academic block

Fifth floor components:

- Basic aeronautical meteorology room
- Advanced aeronautical meteorology room
- Conventional cartography room
- AIS digital cartography
- AIS automation
- Lab
- Advanced basic AIS rooms (2)
- AIS specialist rooms (2)
- Advanced radio teletype operations room
- Aeronautical communication service supervisor
- Aeronautical mobile service operator
- Aeronautical fixed service operator

- Area airways refresher room
- Basic AIS
- Utility rooms & toilets

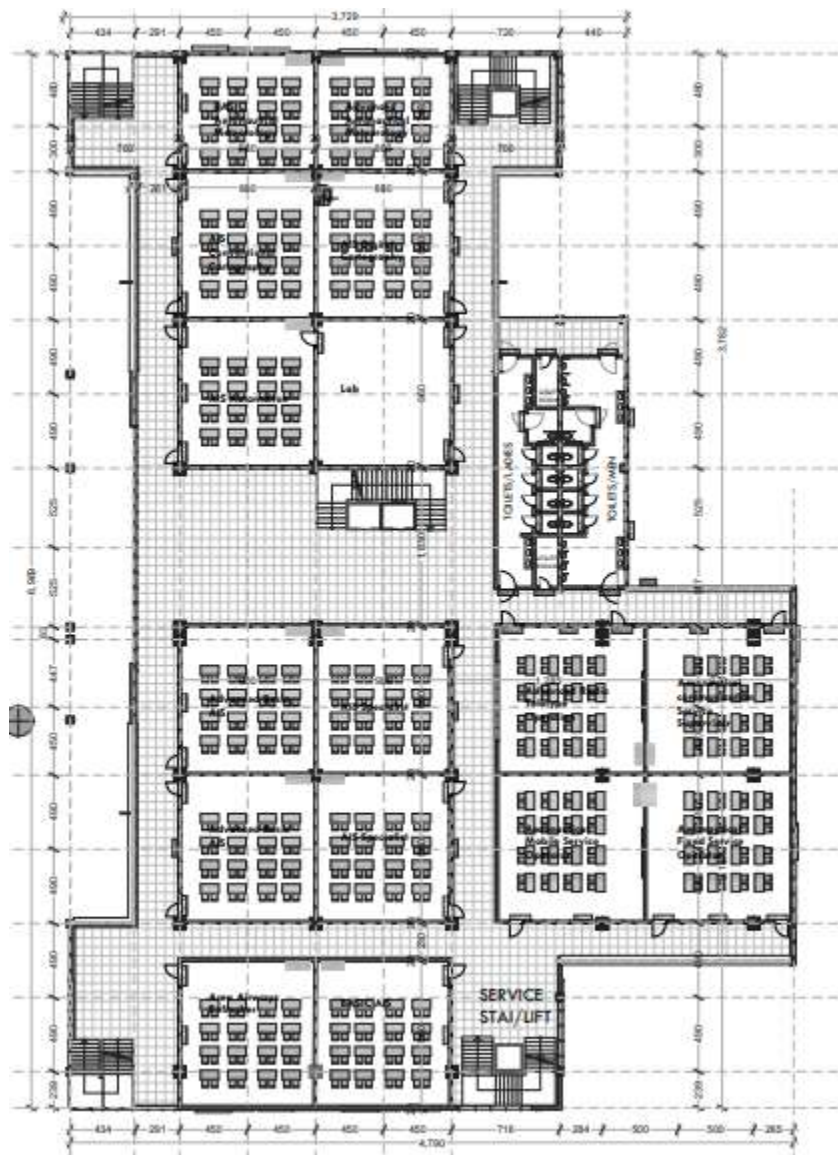


Figure 18: Fifth floor layout of the academic block

Sixth floor components:

- VOR refresher course room
- JLS refresher course room
- Special message checking and accounting room
- Communication operation technical knowledge course room
- VCCS refresher course room
- CNS induction course room
- Lab (5)
- VHF volmet broadcast room

- Junior airport fire offices
- Advanced radiotelephony operation
- Basic airport fire fighters
- Utility rooms and toilets

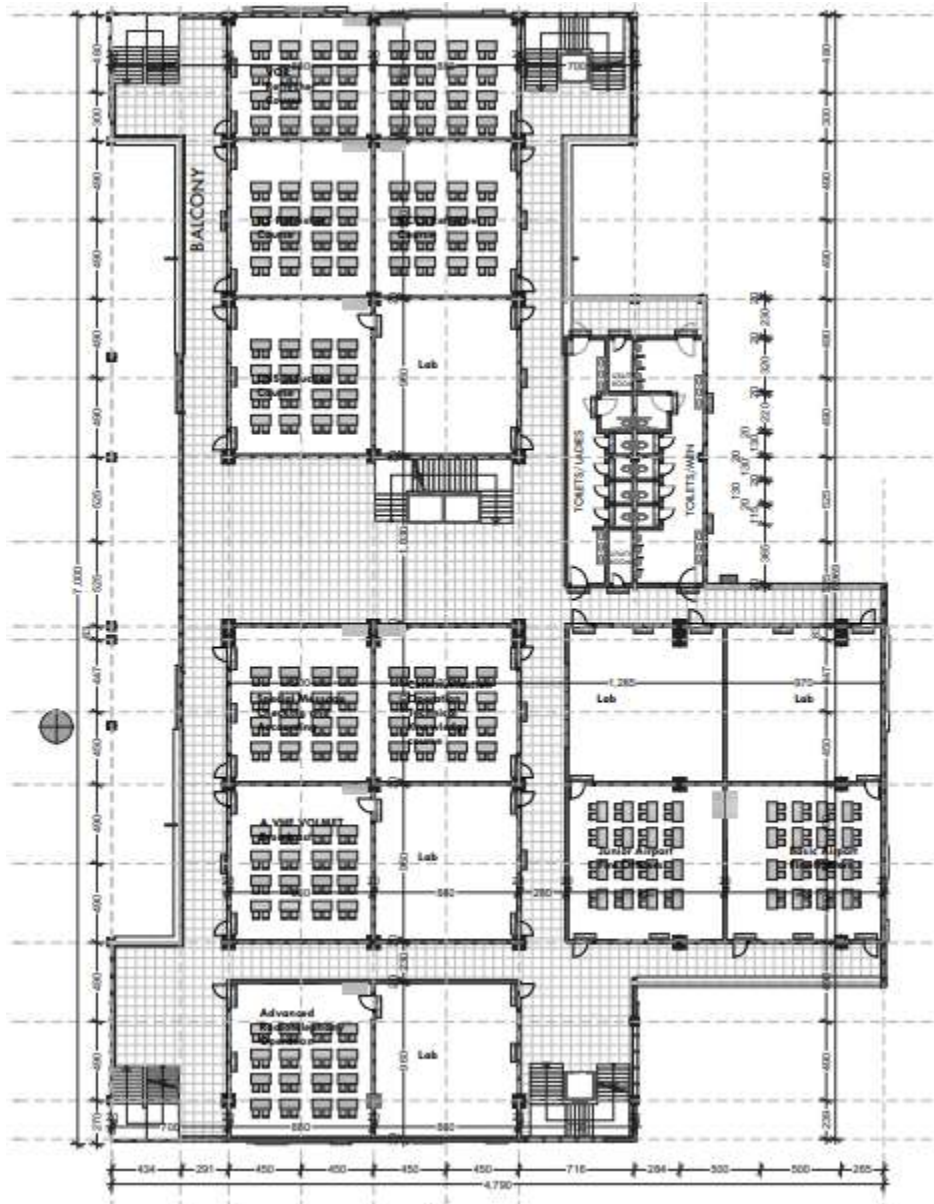


Figure 19: Sixth floor layout of the academic block

Seventh floor components:

- Reading room, library
- Dining hall
- Utility rooms and toilets

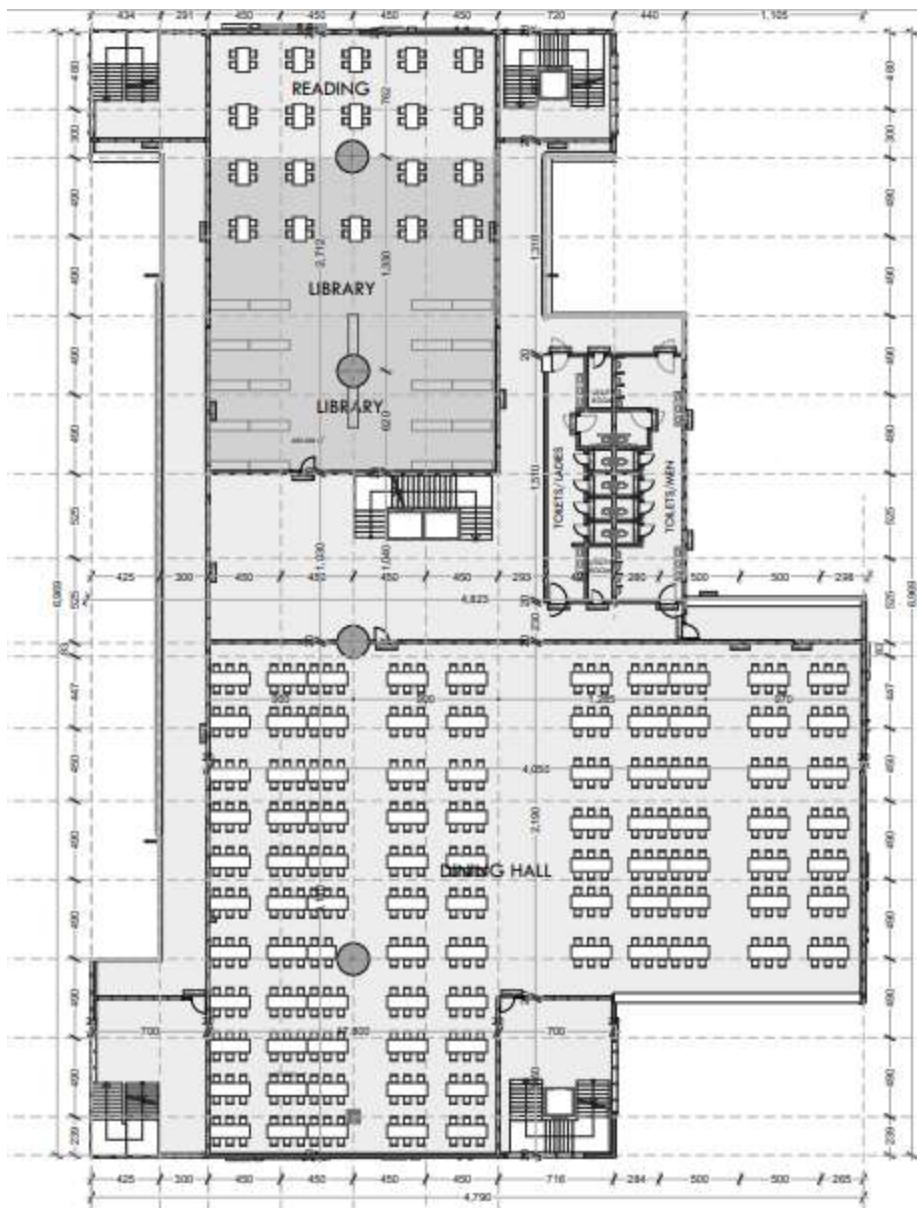


Figure 20: Seventh floor layout of the academic block



Figure 21: Section view of the academic block

3.8.2.2 Hostel block





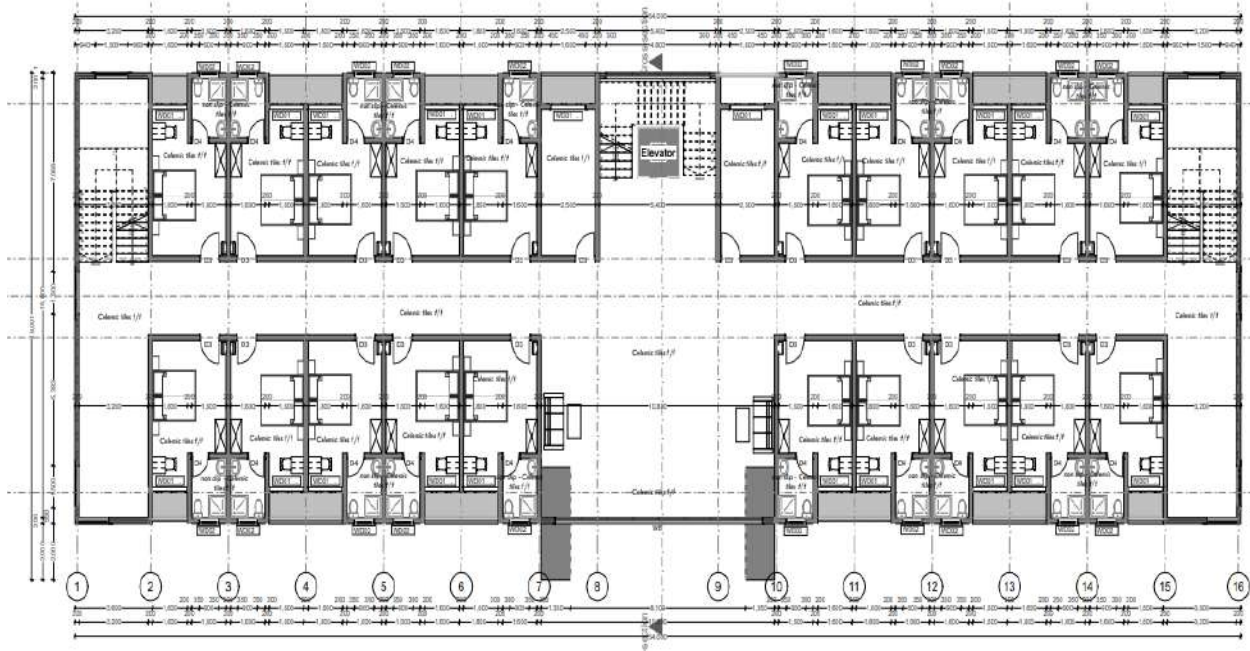


Figure 24: First floor layout of the hostel block

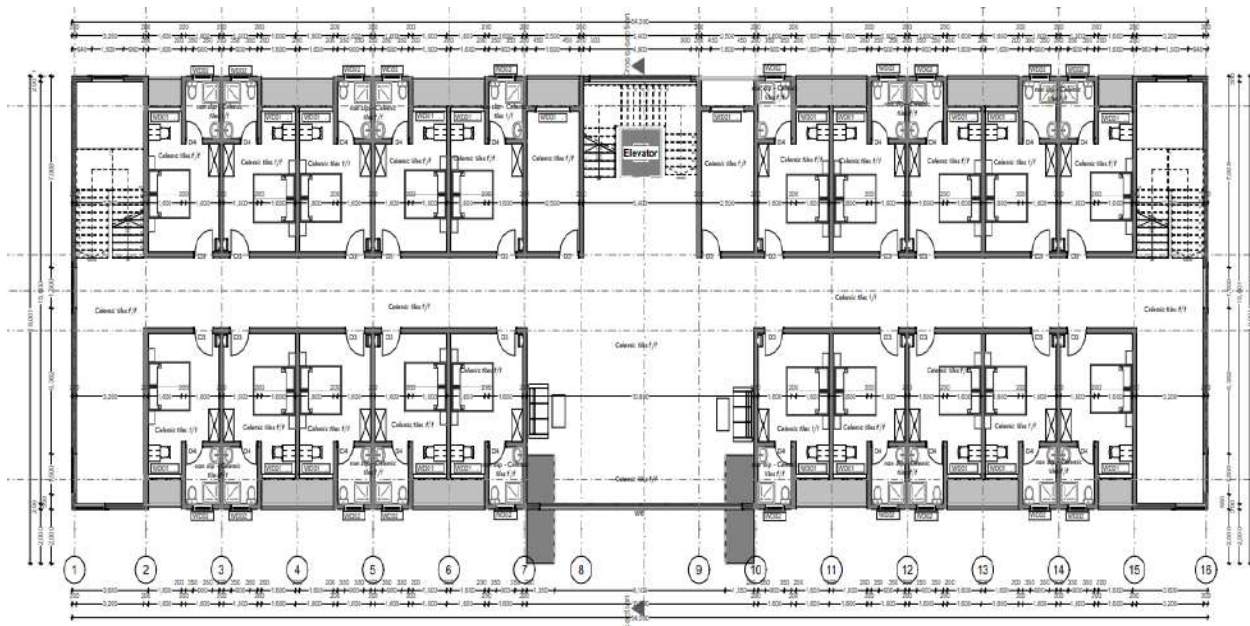


Figure 25: Second floor layout of the hostel block

3.8.2.3 Gym, changing room & staff quarters.



Figure 26: Perspective view of the gym, changing rooms, & staff quarters.

Ground floor components:

- Locker rooms
- Gym
- Cleaning storage

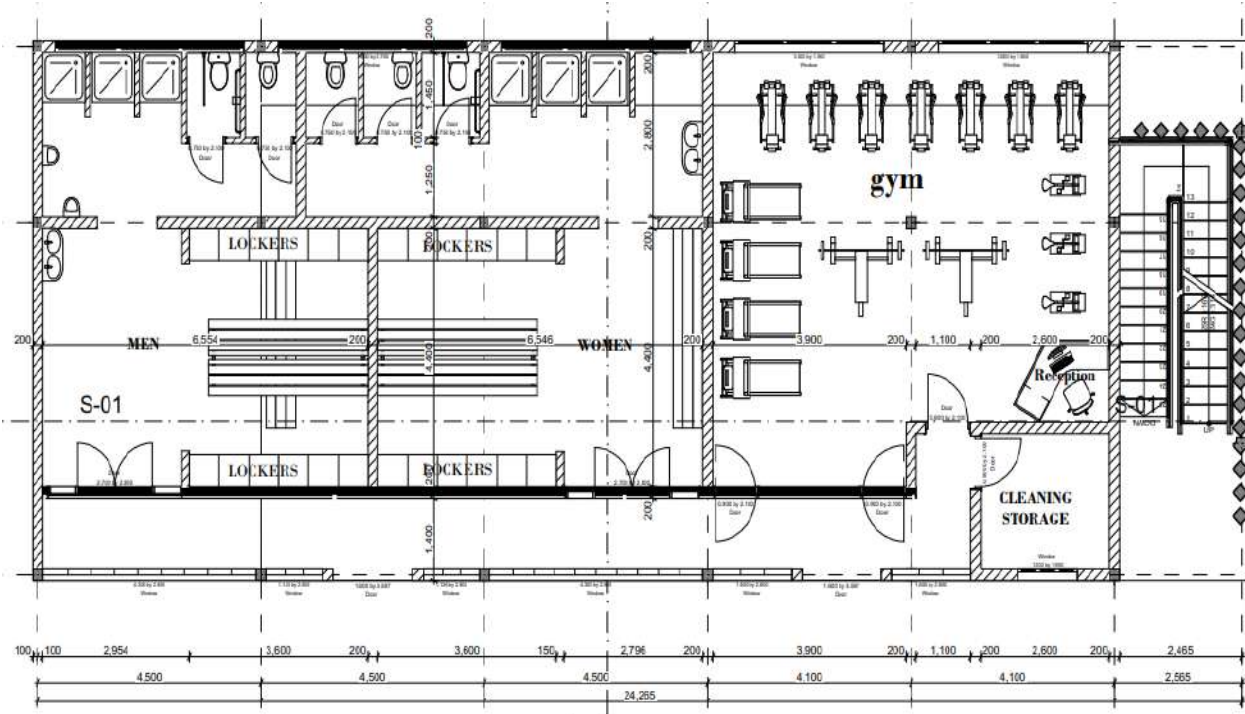


Figure 27: Ground floor layout of the gym & staff quarters

First floor components:

- Rooms
- Terrace
- Toilets

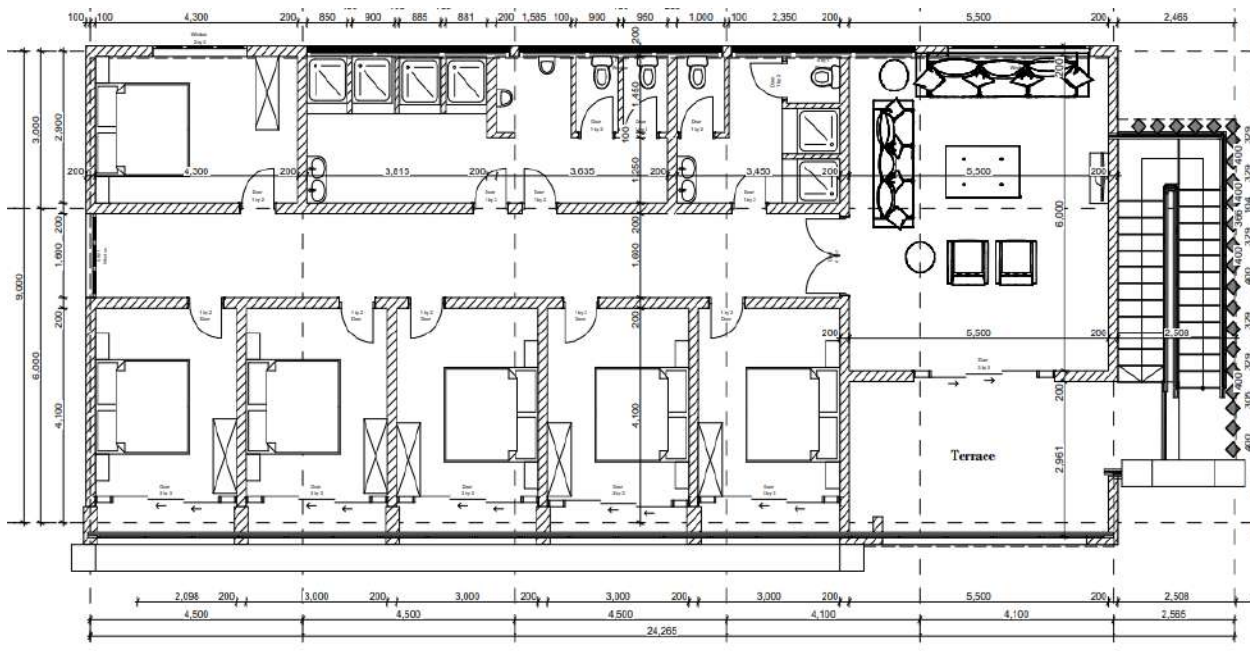


Figure 28: First floor layout of the gym & staff quarters

3.9 Design considerations

The design of the proposed project facilities has incorporated the following design considerations:

For the CoE Aviation Training Center

- The design of the site makes use of the steep slope by incorporating the academic block in a manner that aligns with the topography. This, in turn, presents an advantageous situation for the training center buildings that are situated below the KIA runway level, resulting in them being unaffected by the noise from the aircraft.
- To take advantage of gravity, the wastewater treatment plant has been positioned in the lower part of the site. This plant has been designed for the recycling and treatment of wastewater, as well as its reuse.
- The recreational facility (swimming pool) is placed to the periphery close to the secondary entrance which will facilitate the use by external users for commercial purposes in cost recovery.
- The second academic block, which is reserved for future extensions, includes an auditorium that has been designed to take advantage of the topography by being stepped. The auditorium will also be accessible to external users for commercial purposes, allowing for cost recovery.
- The design of the training center takes into account gender considerations. The girls' accommodations are separated from the boys' accommodations to maximize privacy and safety. Moreover, the number of washrooms reserved for girls is higher, as circumstances may require them to spend more time in the washroom, thus avoiding long lines.

For the Aircraft Hangar

- The hangar is designed in accordance with civil aviation regulations in matters pertaining to safety of personnel and equipment. The hangar design optimizes layout and configuration for the routine operation, including efficient circulation, proper handling activities and smooth aircraft movement.
- The use of electric cars is encouraged, and non-motorized mobility is prioritized through the use of pedestrian-friendly paving. Additionally, the road connecting the hangar to the academic block, which spans a length of 1 kilometer, is proposed to be a non-motorized pathway.

For both Hangar and Aviation Training Center

- To prevent surface run-off, various measures have been employed, including the installation of an adequate drainage system and stormwater management system, planting of grasses and trees using as NBS (Nature-Based Solutions), and the use of paving materials that allow for stormwater penetration into the ground.
- The design of the building aims to optimize energy usage by installing solar panels on the roof that are positioned to receive maximum sunlight radiation. However, the proposed solar panels will need to undergo a review and evaluation process by both the RCAA and RAC before being approved. Additionally, an aeronautical study will be conducted to assess the impact of solar panels on aviation activities.
- The electrical design proposes the use of energy-efficient LED lighting for lighting and motion sensors for handwashing, further promoting energy efficiency.
- The project incorporates a rainwater collection system that directs all water from the roof to an underground tank for treatment and later use.
- The building is designed to promote natural ventilation by utilizing cross ventilation.
- Natural lighting is optimized through strategic building orientation and openings.

- To minimize carbon footprint and CO₂ emissions, the construction materials to be used, such as cement, stones, Ruliba blocks, burnt bricks for walls, and straw board for partitioning, are sourced locally.
- Electric protection systems and wiring comply with local electric protection standards. Materials to be used in all electrical installation including cables, wires, electrical fixtures, and fittings comply with Rwanda Standards Bureau.

The following requirements of the Rwanda Green building minimum compliance system should also be applied for the establishment of the proposed project facilities:

- Minimize heat gain, improve indoor thermal comfort, and reduce the energy for conditioning the indoor environment through efficient design of building's western façade.
- Provide adequate natural ventilation in all non-air-conditioned building areas, to provide thermally comfortable and healthy spaces for the building occupants.
- Ensure connectivity between the interior and the exterior environment, by providing adequate daylighting.
- Encourage the use of energy efficient lighting to minimize energy consumption from lighting usage while maintaining proper lighting level.
- Encourage the use of energy efficient lifts. Lifts equipped with AC Variable Voltage and Variable Frequency (VVVF) motor drive and sleep mode features.
- Encourage the use of on-site renewable technologies, to reduce the net demand for fossil fuel energy and the environmental impacts associated with its use.
- Encourage use of solar energy for water heating applications in the building, to minimize the environmental impacts associated with the use of fossil fuel energy.
- Encourage sub-metering and continuous monitoring to identify improvement opportunities in building's energy performance.
- Reduce energy consumption during operation of the buildings through efficient air-conditioning system design where required to reduce negative environmental impacts from energy use.
- Reduce potable water demand and uncontrolled storm water run-off through effective rainwater management.
- Reduce the use of potable water by using water efficient fittings.
- Treat wastewater generated on-site, to avoid pollution of ground water and receiving streams through safe disposal, and use treated wastewater, thereby reducing consumption of potable water.
- Promote use of private meters for better control and monitoring of water usage.
- Encourage the adoption of concrete usage practices that are environmentally friendly and sustainable.
- Preserve and enhance greenery to attract biodiversity and reduce heat island effect.
- Encourage adoption of environment friendly practices during building construction
- Use refrigerants with Ozone Depletion Potential (ODP) of zero.
- Use refrigerants with Global Warming Potential (GWP) of less than 50.
- Facilitate segregation of waste at source to encourage reuse or recycling of materials, thereby avoiding waste being sent to landfills. Provide separate bins to collect dry waste (paper, plastic, metals, glass, etc.,) and wet waste (organic), as applicable.
- Minimize heat island effect to reduce negative impact on micro-climate. For metal & concrete roofs use material with a high Solar Reflective Index (SRI) to cover at least 50% of the exposed roof area.
- Provide adequate outdoor fresh air supply, to avoid pollutants affecting indoor air quality.
- Provide good thermal comfort for all developments with air-conditioning systems to promote occupant productivity and well-being. Ensure that air-conditioning systems are designed to allow

for cooling load variations due to fluctuations in ambient air temperature and to maintain consistent indoor conditions for thermal comfort.

- Recognize that buildings are designed to control and keep the background noise in occupied spaces at levels appropriate to the intended use of the spaces and confirm to the ambient noise standards.
- Minimize airborne contaminants, mainly from inside sources to promote a healthy indoor environment. Use of low volatile organic compounds (VOC) paints, and low VOC adhesives.
- Vertical greenery systems on the East and West Façade to reduce heat gain in the building.
- Vegetation to cover 50% of the exposed roof area.
- Occupancy sensors for corridors, staircases, toilets, conference rooms and closed cabins.
- Photoelectric sensors to maximize daylighting.
- Sun pipes for natural lighting.
- High frequency ballasts in luminaires.
- Ensure that the building is accessible to differently abled and elderly.

3.10 Description of construction materials and technology to be used.

The project seeks to meet environmental goals of limiting carbon release into the atmosphere, thus material sourcing for civil works for the project facilities will be done locally as much as possible near the site and within Rwanda. Building materials that are commonly found locally, such as stones, Rubiba blocks, burnt bricks for walls, straw board for partitioning, and cement produced within Rwanda, will be used to decrease the project's carbon footprint and CO₂ emissions.

The nature and size of the Aircraft hangar and CoE aviation training center facilities' construction will be accommodated by a variety of structural techniques and materials. Building materials must be chosen to enhance and sustain the environment. Materials shall be selected on the following additional basis:

- Materials that are made and available locally, avoiding importation.
- Materials that will contribute to a longevity of at least 50 years lifecycle preferably 100.
- That will be recyclable and reused, and without polluting the environment if disposed of.
- Materials that require minimum industrial processing.
- Materials that exert minimal damage to the environment during fabrication.
- Materials that minimize transportation distances and costs.
- Designers who will consider the full life cycle of the product, from creation to arrival at the site during use, and post-occupancy.
- Design for disassembly to allow building products to be reused should that be necessary or desirable.
- Reduction of the use of cement, benchmarking against other local buildings, and adopting standard construction practices that reduce the use of cement.

The following materials, which are generally locally available and approved by Rwanda Standards Board (RSB), shall be used in the construction of the Aircraft hangar and CoE aviation training center:

- Reinforced Concrete Frame Structure
- Rubble Stone Retaining Walls
- Ceramic tiles finish on all rooms and wall tiles in the bathrooms.
- Paint on plastered concrete block walling external and internally.
- Steel doors and Windows
- Timber Interior doors.
- Concrete block paving for driveway and parking
- Gypsum board for interior floor ceiling

- Aluminum frame
- Fiber board
- Glass balustrade
- Approved insulated roof sheeting.

3.11 Project Management

3.11.1 Project Institutional and implementation arrangements

Institutional arrangements: The project will be implemented by Aviation Travel & Logistics Ltd (ATL) through its subsidiary Akagera Aviation with Rwanda Development Board (RDB) assuming overall coordination responsibility through its Chief Skills Office. ATL will coordinate and provide the necessary aviation sector specific technical support while the RDB will provide project management services i.e., finance, procurement, M&E and audit of project activities.

Project implementation arrangements have been designed to support the existing GoR arrangements for project implementation through an established SPIU³⁸ hosted at RDB. Following this arrangement, the RDB SPIU will oversee project coordination while ATL will take charge of the day-to-day implementation.

3.11.2 Project Ministerial Advisory Committee

The Ministerial Level Advisory Committee will act as a high-level committee responsible for ensuring that the project outcomes are achieved. The key functions of the committee are to provide strategic oversight of overall project delivery against project outcomes; provide strategic guidance on overall project delivery and unlock issues when they arise; meet on a quarterly basis.

The committee will be composed of:

- Hon. Minister of Infrastructure.
- Hon. CEO of Rwanda Development Board.
- Hon. Minister of Education.
- Hon. Minister of Finance and Economic Planning
- Chief Technical advisor, Ministry of Infrastructure –Secretary of the Committee

3.11.3 Project Steering Committee

The Government will ensure a Project Steering Committee (PSC) is established before the first disbursement of the Loan. The PSC will have a high-level intergovernmental steering committee that will provide oversight to project implementation and facilitate cooperation among all stakeholders. A Steering Committee (SC) will guide, oversee, and review implementation progress. The Permanent Secretary (PS), MININFRA will chair the SC meetings. All Senior Managers of the agencies implementing the project and other key stakeholders will attend the meetings. RDB SPIU will serve as the Secretariat of this PSC.

Attendance to PSC meetings will be as follows:

- Permanent Secretary, Ministry of Infrastructure – Chair of the PSC
- CEO, ATL Deputy Chair of the PSC

³⁸ SPIU – Single Project Implementation Unit

- Chief Skills Officer, RDB, Member
- DG, RCAA, Member
- Chief Technical Officer, MINEDUC, Member
- MD, Akagera Aviation, Member
- CEO, Rwandair, Member
- MD, Rwanda Airports Company, Member
- Any other relevant managers from institutions that might be appropriate as agreed upon by the PSC.

The PSC, at its discretion, shall invite other project staff to attend meetings as observers. The PSC will meet monthly or more frequently if deemed necessary to discuss project activities. Under specific circumstances, the Permanent Secretary (PS) could request an ad-hoc PSC meeting to address specific Project-related implementation issues.

Responsibilities of the PSC

Its responsibilities are to:

- Meet quarterly to review implementation progress.
- Provide overall guidance for effective and timely project implementation.
- Oversee disbursements.
- Ensure sectoral coordination and consistency of project activities with sector policies and strategies.
- Review on a regular basis: progress of implementation plan, progress reports submitted to the Bank, Annual Work Plans (AWPs).
- Review financial audits and any other issues related to the project needing managerial decision.
- Decide actions for facilitating implementation, particularly in troubleshooting cases of slow implementation, bottlenecks, or conflicts.
- Propose corrective actions as needed under the overall strategic guidance of the Ministerial Advisory committee.
- Coordinate and harmonize activities of agencies involved in project implementation.

The **Project Management Team (PMT)** will technically advise on the project's strategy to be fully implemented within the relevant budget and timeframe.

Specifically, the PMT will:

- Coordinate and provide quality assurance and quality control in the processes of Project Implementation.
- Coordinate and provide proper and regular monitoring and evaluation of the project and its interventions.
- Ensure proper management and apply stringent accountability arrangements for the management of the financial resources allocated to the project.
- Ensure that procurement processes and procedures used by the project comply with the applicable Bank's procurement guidelines.
- Ensure proper human resources management practices conforming to the applicable guidelines.
- Meet on monthly basis and on ad-hoc upon the request of the chair of PMT.
- Reports to the PSC on a Quarterly basis

Project implementation arrangements: MINECOFIN being the ‘borrower’ will enter into an implementation agreement with RDB, ATL and Akagera Aviation stipulating the roles and responsibilities of the two entities. This agreement will be submitted to AfDB for a no objection. The project will be implemented through the following arrangements:

- RDB-SPIU:** Under the SPIU Coordinator there will be a specific Project Coordinator to coordinate finance, procurement, M&E and audit of project activities. In the SPIU there will be provision for a Procurement expert³⁹, Finance Specialist, M&E Specialist and Project Internal Auditor.
- ATL & Akagera Aviation:** Given the expertise of the existing ATL & Akagera Aviation team, they will take charge of preparing bidding documents for technical activities to be reviewed by RDB-SPIU; direct supervision of civil works; training programs and other technical project activities.

The detailed description of positions (titles and quantity) is presented in the following figure.

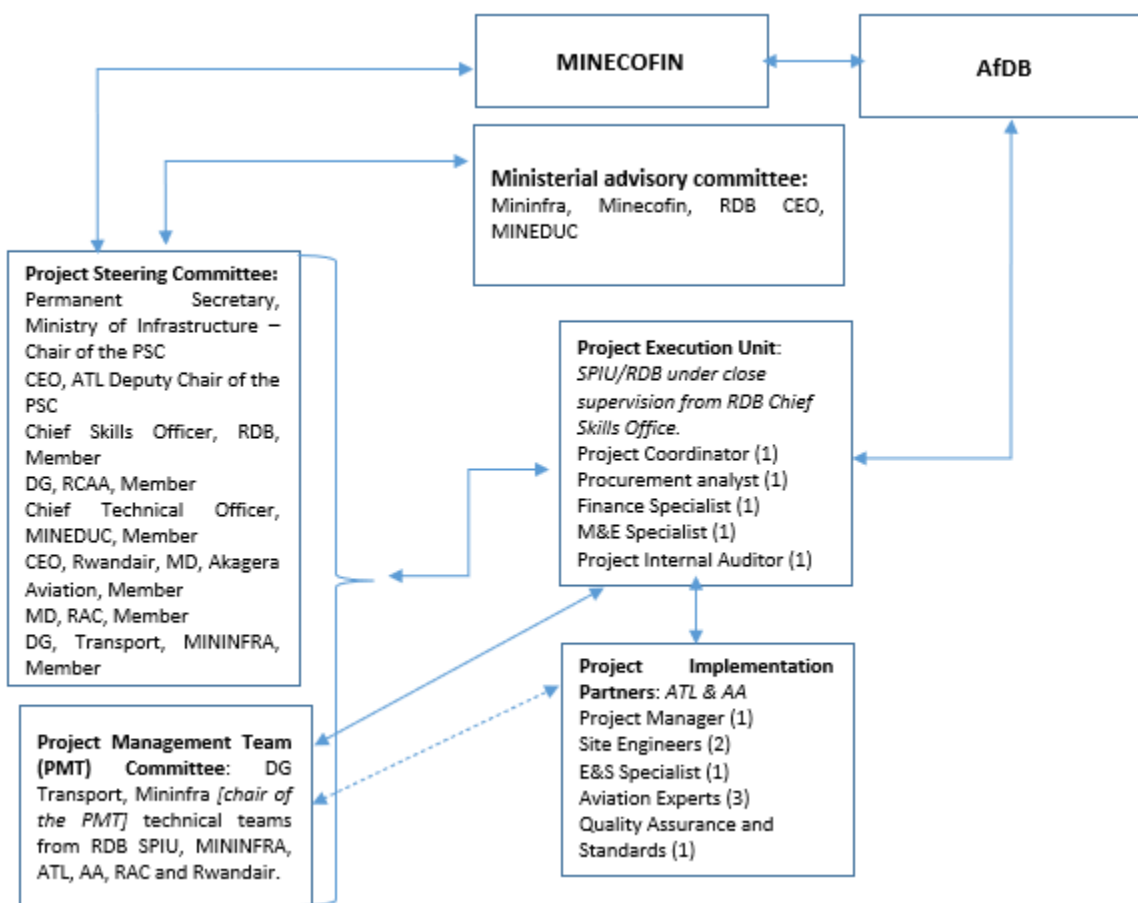


Figure 29: Overall Project Institutional and Implementation Structure

³⁹ Caliber of an expert because of the complexity of this project

3.12 Associated facilities & services

3.12.1 Liquid waste management

In an effort to promote sustainability and reduce wastewater, plans have been made to construct separate wastewater treatment plants for both the hangar and aviation training center. The plants will be designed to treat grey water, which will be generated by the facilities during operations. The treated water will then be repurposed for various non-potable uses, such as cleaning, irrigation, and toilet flushing.

To take advantage of gravity, the wastewater treatment plant for the aviation training center facilities will be positioned in the lower part of the site.

During construction, it is necessary to provide temporary sanitation facilities for workers, and in this case, the use of temporary ecosan toilets is advised. These toilets are designed to have minimal environmental impact, as they conserve water and offer opportunities for composting human waste.

3.12.2 Refuse management

For solid waste management within the hangar and aviation training center facilities, this is to be handled through the management. Appropriate areas will be provided with storage bins for collection, and strategically placed within the hangar and aviation training center facilities. The storage bins will be clearly marked for segregation of each type of waste. The central collection refuse rooms should be chilled to reduce odors and flies. Transportation of solid waste will be done by the private sector, which goes directly to the Nduba dump site, as a means of solid waste management. Private associations or cooperatives select organic types for composting, non-organic to be reduced and recycled.

The airport waste management team will dispose of hazardous waste at a specific hazardous disposal site, while RAC has a contract to collect garbage at KIA and deposit it at a recommended waste receiving site in Kigali. RAC also has an MoU with REMCO for the recycling of steel scraps. The hangar facility will follow KIA's wildlife hazard management plan, and both the airport waste management team and RAC will responsibly handle waste using appropriate disposal and recycling methods.

3.12.3 Sanitary facilities

The proposed project facilities will have a comprehensive drainage system that includes drains, sewage piping, and inspection chambers. Proper trapping and venting will be emphasized to prevent unpleasant smells and to comply with health regulations. The sanitary fittings and accessories will consist of standard medium luxury ceramic materials. Additionally, high-quality stainless steel will be used for the building.

To maintain cleanliness, professional cleaners will be responsible for cleaning all areas of the project. The housekeeping officer will be responsible for monitoring and ensuring that cleaning is conducted daily.

3.12.4 Water supply and storage

During the construction stage of the proposed project, it will be essential to use a daily quantity of water ranging from 10 to 30 cubic meters for constructing the hangar, and 20 to 40 cubic meters of water for constructing the academy. After the construction phase, during the operation of the project, the hangar operations will necessitate about 8 to 20 cubic meters of water each day, while the academy operations will need around 15 to 25 cubic meters of water on a daily basis.

The proposed hangar facilities will be connected to the existing KIA water supply network and nearby WASAC water tank while the training center connects to the public water supply system. The water supply

system has been specifically designed to ensure that the water pressure and flow rate are suitable for the intended use, and that the water remains free from any impurities that could make it unsafe to drink. The design of this system has taken into account the expected water consumption rate at peak times, and it has been configured to allow water to flow by gravity.

3.12.5 Rainwater harvesting & stormwater management.

To complement the existing municipal water supply for both the hangar and training facilities, a plan has been put forth to harvest rainwater. The process involves collecting rainwater from the roof, which will be directed into an underground tank via rainwater down pipes. A pumping system will then be utilized to distribute the collected water to the buildings. However, before being drained into the reservoir, the water will need to undergo filtration.

The implementation of a rainwater harvesting system is an environmentally conscious approach to reduce soil erosion and promote the utilization of natural resources. The size of the rainwater storage tank will be determined based on the size and orientation of the roof.

3.12.6 Surface drainage

A storm water drainage system is designed to collect and convey run-off generated during and after rainfall events, for safe discharge into a receiving watercourse. The magnitude of peak flows that have to be accommodated is calculated to be high due to the nature and size of buildings and adjacent facilities especially parking space. Planning and sizing the storm water collection and discharge structures was done thoroughly, taking into account meteorological data available.

Therefore, rainwater from paved areas shall be collected by open / closed drains and discharged to the public storm sewer system. The public stormwater sewer system beneath the aviation training center discharges stormwater to the Rubirizi wetland located in the larger area of indirect influence of the project site. To account for the slope of the academy training center site, the channels will be designed in a manner that accommodates the South and Westward gradients of the lower part of the project site. Inspection chambers will be provided to allow for inspection and smooth flow of water into the public sewer.

To further reduce the risk of surface runoff, nature-based solutions (NBS) such as planting grasses and trees, as well as using permeable paving that allows stormwater to seep into the ground, will be implemented. These measures will help to mitigate any potential issues caused by the runoff of rainwater on the site.

3.12.7 Power supply

During the project's construction phase, the aircraft hangar facility is expected to consume approximately 200 to 300 kilowatt-hours (kWh) of electricity, while the aviation training center facility will require 400 to 600 kWh. Once the facilities are operational, the hangar will require between 100 to 250 kWh of electricity, while the aviation training center will require between 250 to 400 kWh.

For the supply of this quantity of power to the facilities, the proposed hangar and aviation training center facilities will be connected to the existing KIA substation. Both the Aviation hangar and academy training center will be connected to backup generators for emergency power supply in case of a power outage. The generator will be located in a soundproof enclosure close to the hangar to reduce noise pollution, and this setup will avoid the need for lengthy distribution cables. To prevent overloading the public distribution line and causing insufficient power voltage in the hangar, a separate transformer will be installed near the hangar to provide a dedicated power supply.

To maximize energy use efficiency and minimize resource exploitation, solar panels will be installed on the roofs of both the hangar and aviation training center to supplement the energy requirements within the facilities. However, the proposed option for solar panels will need to undergo a review and evaluation process by both the RCAA and RAC before being approved. An aeronautical study will be conducted to assess the impact of solar panels on aviation activities.

The following are the details of the proposed solar panel system:

For the Aircraft Hangar:

- Solar Panel System Size: 4kW
- Number of Solar Panels: 96
- Required Roof Space: 168 sq. meters.
- Annual Electricity Output: 20400 kWh

For CoE Aviation training center:

- Solar Panel System Size: 4kW
- Number of Solar Panels: 64
- Required Roof Space: 112 sq. meters.
- Annual Electricity Output: 13,600 kWh

The hangar shall be fitted with a galvanized metallic pole 3 meters high above the hangar roof and 120mm Diameter. The purpose of the pole shall be to host a radio link antenna. CAT 6 SFTP shall be installed in the hangar to enable data connectivity within the entire perimeter of the hangar and adjacent offices so as to supply data in the entire hangar and other adjacent facilities. A three-phase power must be installed in the Hangar at the designated place.

3.12.8 Emergency services

The Kigali International Airport has a well-established emergency response plan in place to handle any unforeseen incidents that may occur during its operations. This plan is designed to provide assistance and support services in a uniform manner, ensuring that all specifications are met.

As emergencies and disasters can happen at any time without warning, it is essential for construction sites to prepare for them to minimize panic and confusion. Therefore, Emergency Response Plans (ERP) will be instituted throughout the proposed project cycle.

To ensure effective emergency management during the project's operational phase, the proponent will adhere to the existing emergency response plan for KIA. The regular operational documents contain information on how the proponent will respond to different incidents that may occur during the project.

3.12.9 Fire protection & Rescue services

The planned project facilities at Kigali International Airport do not have a separate fire protection system of their own. Instead, the proposal includes the installation of automatic firefighting systems on the site. These systems will be supplemented by the existing KIA fire brigade in the event that the system encounters difficulties in effectively handling a fire incident.

The following describes the "Fire Protection" services to be considered for the development and are based on the requirements of by-laws governing Public Institutions protection against fire. The fire systems to be considered shall be selected depending on the buildings design, sizes, and fire risk. Some of the possible systems include fire sprinkler systems, fire hydrant systems, portable fire extinguishers, fire suppression

systems, and fire hose-reel system. A firefighting tank and a pumping system shall be designed depending on the firefighting system chosen.

The fire protection system for the proposed project will consist of: Fire Hydrant, Fire suppression, Fire detection and Warning system.

Portable Fire Extinguishers

These are basic fire protection equipment to provide the occupants of the buildings with a first aid and means of fighting a fire whilst awaiting the arrival of the local fire brigade or other firefighting Agencies. It is proposed along escape routes or adjacent to fire exits so that occupants of the buildings and visitors escaping from an outbreak of fire will pass them on their way to safety and can use them without having their means of escape cut off.

Portable fire extinguishers are designed for a specific class of fire and their use shall be explained to the users on completion of the project.

Fire Hydrant

Fire hydrant system is a network of fixed pipelines with discharge hydrant and at designated areas. It is fitted into the Council mains and be used by the Fire Brigade in the event of a fire outbreak.

Fire protection levels shall be designed to ensure optimum levels to avoid over protection, which results in high capital, tie up without due returns and or under-protection, which results in exposure to unnecessary risk. The distance and response of the fire brigade shall be taken into consideration. The fire hydrant will be installed near the building and will have enough water and pressure.

Fire Alarm System

The fire detection and alarm system has been designed to accurately detect and identify the source of heat / smoke / fire at early stages to minimize false alarms due to faulty equipment, electrical transients, system faults etc.

The fire protection and rescue services during the operation of the facility will typically be provided by specialized teams of firefighters and first responders, who are trained to respond quickly and effectively to emergencies involving aircraft, as well as other types of fires and hazardous materials incidents. These teams will be equipped with specialized vehicles and equipment, including firefighting foam, water cannons, and other tools that are specifically designed for use in airport environments. Fire services water supply is maintained in the bulk water tanks at all times reserved for fire protection.

In addition, there will be provided alarm sounders and fire/hazard escape routes. Permanent personnel will be trained on the use of those equipment. An aircraft hangar is one of the places where appropriate fire suppression systems are the most critical: protecting aircraft and hangar, as well as valuable equipment and personnel is going to rely on careful planning and design, as well as a combination of water-based and/or dry-chemical-based fire suppression systems.

Fire sprinkler system

Fire sprinklers play a critical role in ensuring effective fire suppression while maintaining the integrity of the protected environment. In the context of the aircraft hangar and CoE aviation training center, integrating fire sprinklers into the firefighting system is of utmost importance to enhance overall fire safety. To achieve this, a comprehensive fire protection plan will be developed, encompassing the installation of an automatic fire

sprinkler system throughout the facility. Compliance with local fire codes and regulations, as well as considering the specific needs of the space, should guide the design of the sprinkler system.

Strategic placement of sprinkler heads is essential, covering all areas within the hangar and training center, including high-risk zones such as hangar bays, classrooms, and laboratories. Given the presence of flammable fuels and aircraft, special attention should be given to designing the sprinkler system to account for potential fuel fires. This may involve incorporating foam or other specialized suppression systems where necessary. Integration with the facility's fire alarm system is crucial, allowing for immediate activation and notification in case of a fire. The proposed warning system should have automatic detection with smoke detection and heat sensing.

Furthermore, the fire sprinkler system should have its own dedicated water supply, which can include water storage tanks, pumps, and connections to the water system. This comprehensive approach ensures the protection of lives, property, and the hangar structure, supporting the safe operations of the project facilities.

3.12.10 Air traffic control tower

The existing air traffic control tower (ATCT) will continue to keep an eye on all aircraft in the area surrounding the airport, including those approaching and leaving the hangar. During the practical training for students using the aviation academy training center, the air traffic controller in the tower will coordinate the movement of the aircraft with other aircraft in the area as well as indicate when it is time for it to leave the hangar and taxi to the runway for takeoff. This will be done to ensure a safe and efficient flow of air traffic.

3.12.11 Security

The proposed aircraft hangar and CoE aviation training center, being located within the Kigali International Airport (KIA) and airport buffer respectively, can benefit from the robust security measures implemented both inside and outside the terminal. Adhering to the existing Kigali International Airport Security Plan is imperative for any development within the airport premises to ensure the utmost safety and security for passengers, airport personnel, and facilities. This comprehensive security plan serves as a framework that outlines protocols, procedures, and measures aimed at mitigating risks and safeguarding against potential threats.

To comply with the security plan, the development should incorporate the prescribed security measures. This may involve integrating access control systems, surveillance cameras, intrusion detection systems, perimeter fencing, and other physical security measures as outlined in the plan. Furthermore, the design should prioritize the efficient and secure movement of trainees and staff, taking into consideration the established principles governing the flow of individuals within the airport environment.

3.12.12 Ventilation system

The ventilation system of the proposed project facilities will be carefully planned and designed to ensure sufficient airflow at specific strategic points within the building. Ventilation facilities may include wide wire meshed windows (starting from 1.5 m height above the burnt brick of the wall up to the roof) or energy operated ventilators, to eliminate odors and avoid suffocation problems. The external condenser unit associated with the ventilators should be put at ground level.

In addition, special windows as alternative aeration systems should be provided within the building. These windows can be opened when needed to facilitate the flow of fresh air into the building, thereby eliminating any bad odors and preventing suffocation problems that may arise due to poor ventilation.

The building will maximize natural ventilation through cross ventilation as well as natural lighting will be maximized through building orientation and openings.

3.12.13 Road and Accessibility & Parking space

The project site will be accessible through two roads, which will allow the center to have two entrances. The main access to the training center will be through the tarmac road located at the lower part of the site, while the main block or academic block will be adjacent to the main road or the main entrance. The project planning will consider the new road proposed by the Kigali Master Plan 2050, which will pass through the site and will serve as a service road within the center.

The first access is the tarmac road located at the boundary of the Busanza Airport. The second access is the airside access road, which will be exclusive to pedestrians and bicycles, promoting sustainable non-motorized transport and fitness. Additionally, parking spaces have been provided to accommodate cars that will be utilizing the facilities. The aircraft hangar will provide taxiways that will connect to the existing runway. The road connecting the hangar to the academic block (1Km length) is proposed to be non-motorized.

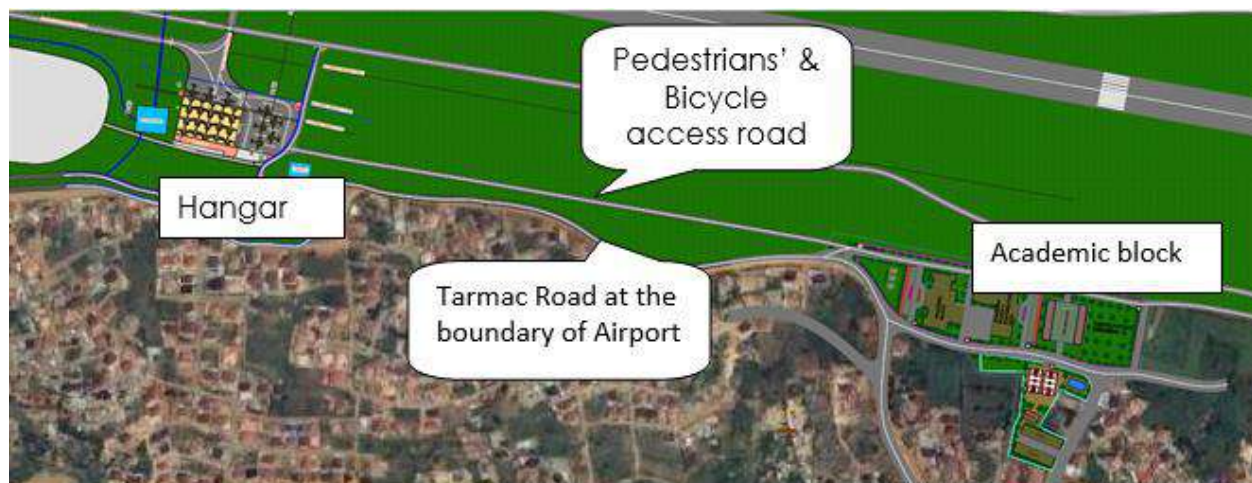


Figure 30: Access to the site

3.12.14 Telecommunication and internet services

The project will ensure the provision of high-quality and high-capacity telecommunication and internet services. This will enable effective communication and connectivity among the various stakeholders involved in the project. In addition, the project plans to upgrade the special webpage of Akagera Aviation Ltd to increase communication and marketing.

The upgraded website will serve as an informative platform for the public, displaying various project activities, contacts, personnel, products, and events. This will create more visibility and awareness of the project and its offerings. Furthermore, the website will be designed to be user-friendly, easily accessible, and interactive to enhance user experience.

Telephone services are available through provision of landlines and a variety of wireless telephone networks such as MTN and Airtel. The Internet can be provided through wireless telephone networks, Canal Box, Starlink, optical fibers of Liquid Telecom.

3.12.15 Landscaping

The project has been designed with a focus on landscaping to create a conducive environment for operations and a greener space. The building components will be covered while allowing for a dense green landscape with trees. This will improve the livable space for innovation and entertainment within the facilities.

The project will also include a water treatment plant for wastewater recycling and treatment. Greywater will be recycled for further use. The building orientation and openings have been strategically designed to maximize natural lighting. Overall, the landscaping and design plan will ensure a sustainable and eco-friendly environment for the project.

3.12.16 Gender consideration

In the design of the training center, gender consideration was taken into account, with separate accommodation provided for girls and boys. The girls' accommodations are designed to maximize privacy and safety, with their rooms separated from the boys' accommodation. Additionally, a higher number of washrooms have been reserved for girls to avoid long lines, taking into account that they may require more time in the washroom.

4.0 PROJECT ENVIRONMENT

This chapter uses remarkable environmental elements to demonstrate the description of the study area's current environmental situation, with baseline data collected through primary surveys that were conducted through scoping and site walkover. Additional information was gathered through web research and datasets made available in earlier studies carried out for similar projects.

This section provides an overview of the project area and its surroundings, including the Kicukiro District, before delving into the specifics of the project's exact location. The physical and socio-economic conditions of the region are outlined, taking into account climate patterns, hydro-geological features, atmospheric conditions, water and soil quality, vegetation patterns, and ecological considerations. Additionally, the section details the socio-economic profiles of the population, and the land use practices in the area.

The primary aim of this section is to establish the project area of influence (PAI) and the existing environmental state, which is crucial in determining the potential impact of the proposed project on the environment. By examining the environmental conditions, we can anticipate how the proposed actions might affect the natural world and devise mitigation measures accordingly. It is essential to consider the project's environmental impact during the planning stages to ensure that it adheres to all environmental regulations and reduces negative impacts on the ecosystem.

4.1 Project Area of Influence

Knowledge on the spatial, temporal, and thematic boundaries of the project was essential in identifying the relevant environmental and social issues at the scoping stage, which defined the ultimate scope and depth of this ESIA. Information on the Project Area of Influence (PAI) is important to properly plan public consultations and stakeholder engagement, i.e., where and with whom to consult. Direct and indirect impacts are distinguished as well.

The Project's area of influence includes an Area of Direct Influence (ADI) and an Area of Indirect influence (AII). When defining these areas, it is useful to consider biophysical and socioeconomic impacts separately.

4.1.1 Area of Direct Influence (ADI)

The Project's ADI is made up of two components:

- The footprint area, i.e., the area occupied by the project's infrastructure; and
- The area where direct impacts from the construction and operational activities will be felt.

The footprint includes the area occupied by the Aircraft hangar and that covered by the Aviation training center. In the construction phase, the footprint also includes ancillary infrastructure such as temporary access roads and construction camp sites. It is expected that these ancillary infrastructures will be connecting the project site areas and surroundings. Within the footprint area, several activities will be implemented such as soil stripping, vegetation clearing, earth movements, etc., but they will be largely contained to their footprint.

When considering the Project's direct impacts outside of the footprint area, it is useful to separate the biophysical and socioeconomic impacts.

Therefore, the Project's ADI is delineated as follows:

- **Biophysical environment:** It is expected that all direct biophysical impacts resulting from project construction of different components and operation will be limited within the perimeter of the Aircraft hangar and aviation training center sites, as well as areas immediately adjacent to this site. This

width accounts for the trucks/ vehicles impacting the surroundings of the site and for a wider construction corridor and construction traffic, which will likely be required to establish temporary accesses, machinery movement, etc.

Therefore, from a biophysical environment point of view, the boundary of the airport including the site of the Academy training center is to be considered the ADI.

- **Socioeconomic environment:** The communities surrounding the project site. Even if employment and economy stimulation may extend to other communities, direct socioeconomic impacts are expected to be felt mostly by the communities living in the proximity of the project sites. Therefore, a 1km distance depicted from the perimeter of the project sites was assumed to encompass all impacted communities including to be positively impacted through employment and those to be negatively impacted by possible accidents and hazards, noise, etc. during transport of construction materials and operations of the project during training and maintenance.

Direct impacts are also to be expected in the areas where the auxiliary construction facilities will be located (construction camps, temporary accesses, borrow pits). However, the locations of these areas are not known at the present time, and thus they were not considered for the definition of the Project ADI.

4.1.2 Area of Indirect Influence (All)

The Project's All is the geographic area where indirect impacts are likely to be felt, or in other words, where secondary impacts resulting from direct ones are felt.

As such, the Project's All is defined as follows:

- **Biophysical environment:** In terms of the biophysical environment, few or no indirect impacts are expected outside of the ADI. Therefore, a 1km wide corridor is depicted from the perimeter of the Aircraft hangar and aviation training centre sites.
- **Socioeconomic environment:** Socioeconomic indirect impacts will likely be felt, namely associated with creation of job opportunities, mobilization of workforce, development of informal commercial activities, etc. These indirect impacts are likely to be experienced mostly in the areas closer to the project site.
Therefore, this area is within boundaries of Nyarugunga sector. Benefits and impacts from project-induced changes in the ADI are likely to extend to other communities within these territories such as the neighbouring cells in Kicukiro district, due to labour sourcing, waste management and construction material sourcing.

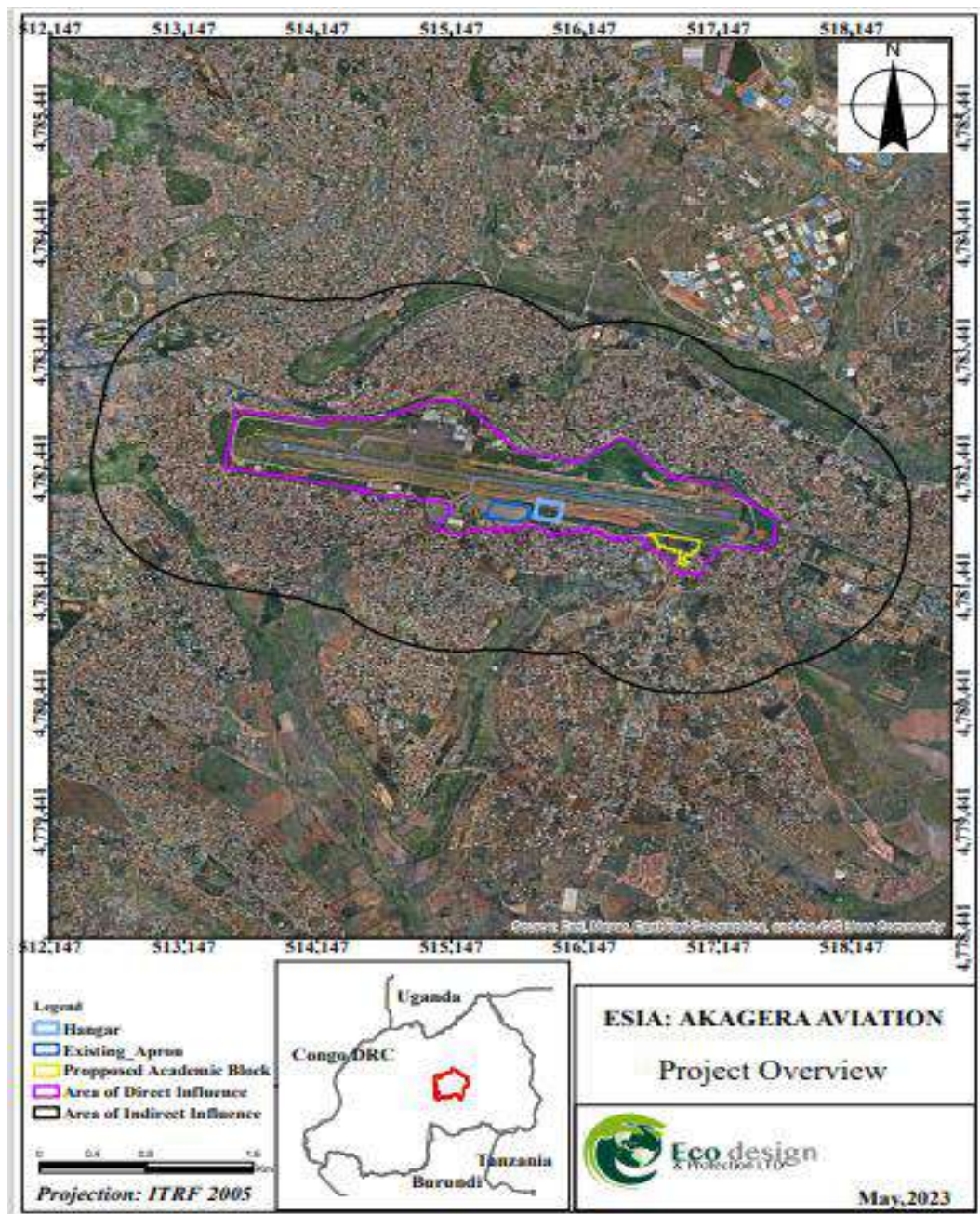


Figure 31: Map showing the site overview.

4.2 Physical Environment

4.2.1 Project site location

The proposed Aircraft Hangar and CoE Aviation Training Center project is set to be established in Kicukiro district's Nyarugunga sector, situated in two distinct cells, namely Nonko and Rwimbogo. The project will comprise of two key components: a hangar and a training academy. The hangar will be located in the landside area of the Kigali International Airport, in close proximity to the south apron of the airport. Specifically, it will be situated 189 meters away from the runway centerline. Access to the hangar will mainly

be through a taxiway connecting it to the existing south apron of the airport. The location's geographical coordinates are -1.970844; 30.143101.



Figure 32: Hangar site location

The Aviation training center site will be positioned in the southeastern region of the Kigali International Airport's exterior plot within airport buffer land use, with coordinates of -1.973815 for latitude and 30.1515136 for longitude. The Kigali International Airport, which is located near Rwanda's capital city of Kigali, is a modern airport that has been rated as one of the top ten airports in Africa for two consecutive years. Over the past three years, the airport has undergone significant upgrades costing over \$30 million, including the installation of a new apron, three taxiways, and a hangar. The airport also features state-of-the-art technologies, such as the Bird Avoidance System, which eliminates bird strikes along the runway, advanced weather observation systems, and air traffic management technologies. These upgrades are intended to ensure top-notch safety, security, and efficiency in the provision of services to passengers, aircraft, and cargo.

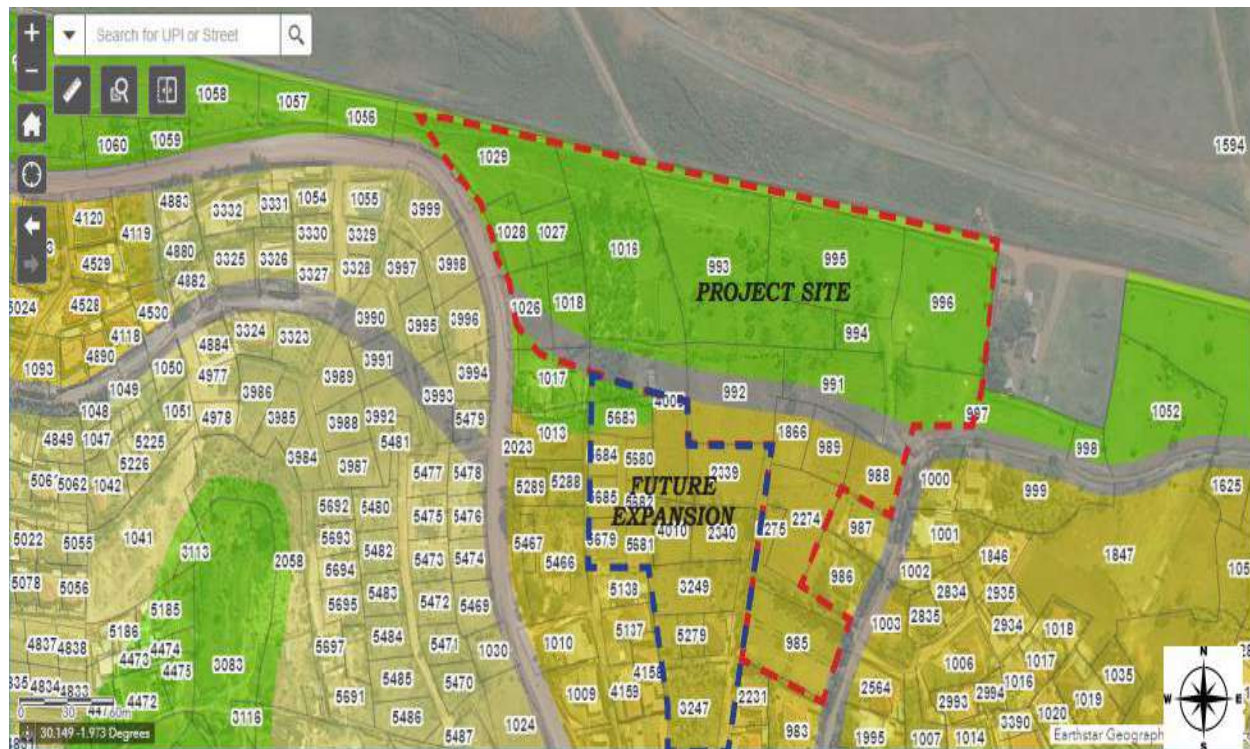


Figure 33: Aviation training center site location



Figure 34: Proposed site Location on City of Kigali Master Plan - Aerial Image.

The figure below displays the project sites and various components that are situated in close proximity to the project area. These components are numbered as follows:

- 1: Proposed Aircraft Hangar - this is the area where the aviation hangar is intended to be constructed, and it will be located on the landside area of the Kigali International Airport, adjacent to the south apron of the airport.
- 2: Proposed Academic Block - this refers to the location where the aviation training academy will be established, and it will be situated in the southeastern region of the Kigali International Airport's exterior plot.
- 3: Existing Kigali International Airport Runway - this is the area where the runway of the Kigali International Airport is situated.
- 4: Akagera Aviation HQ - this component represents the headquarters of Akagera Aviation, which is an aviation company that is located in close proximity to the project area.
- 5: Existing Apron - this is the section of the airport where aircraft are parked, unloaded, or loaded with cargo, and it is situated adjacent to the area where the aviation hangar will be constructed.



Figure 35: Location of project sites and different surrounding components

4.1.2 Climate and rainfall

Rwanda has a tropical climate characterized by its hilly landscape stretching from east to west. The country has four primary climatic regions: eastern plains, central plateau, highlands, and regions around Lake Kivu. Overall, the country has four climatic seasons represented through the long rainy season: March to May, and short rainy season: September to November. These seasons alternate with the long dry season: June to August, and short dry season: December to February. The warmest annual average temperatures are found in the eastern low lying (20 - 21°C) and Bugarama Valley (23 - 24°C)⁴⁰, and cooler temperatures in

⁴⁰<https://www.meteorwanda.gov.rw/index.php?id=30>

higher elevations of the central plateau (17.5 - 19°C) and highlands (less than 17°C). ⁴¹ The rainy season averages heavy rainfall of about 1200mm per year⁴².

Table below shows some of the historical and future climate trends for Rwanda indicating a rise in temperature. Along with the rise in temperature, there is a strong extension of hot periods and a significant reduction in cold periods. A slight decrease in annual precipitation has been observed over the past 30 years. Furthermore, a tendency towards somewhat more intensive and significantly more frequent heavy precipitation and longer dry periods is projected⁴³.

Table 3: Historic and Projected Temperature Data for 2085 for Rwanda

Historical Climate Trends	Projected Future Climate Trends ⁴⁴
<ul style="list-style-type: none"> - Observations of mean annual temperature shows the average temperature has increased. - Temperatures rose by about 1.2°C at Kigali Airport station during 1971-2009. 	<ul style="list-style-type: none"> - The very likely range of projected change in annual mean temperature is from +1.1 to +5.1°C by 2085. Confidence in these figures is medium. The change in temperature can be considered to be medium-strong.
<ul style="list-style-type: none"> - Mean annual rainfall has declined by 80 mm from 1961 until 2006 at the Kigali Airport meteorological station. - Observations of the extent of the rainy seasons (March-May and September-November) exhibit a shortening trend. 	<ul style="list-style-type: none"> - Tendency towards an increase in future precipitation by 2085 during the main rainy season (likely range from -13 to +20%, December to April), whereas for the other months of the year a tendency towards drier conditions is projected (likely range from -30 to +17%).

⁴¹Rwanda meteorology agency

⁴²⁴² https://www.wikiwand.com/en/Huye_District

⁴³ High Level ESIA, ERM, 2021

⁴⁴ Gerics (2016) Climate-Fact-Sheet

Climate Chart Kigali – 1,600m/5,250ft

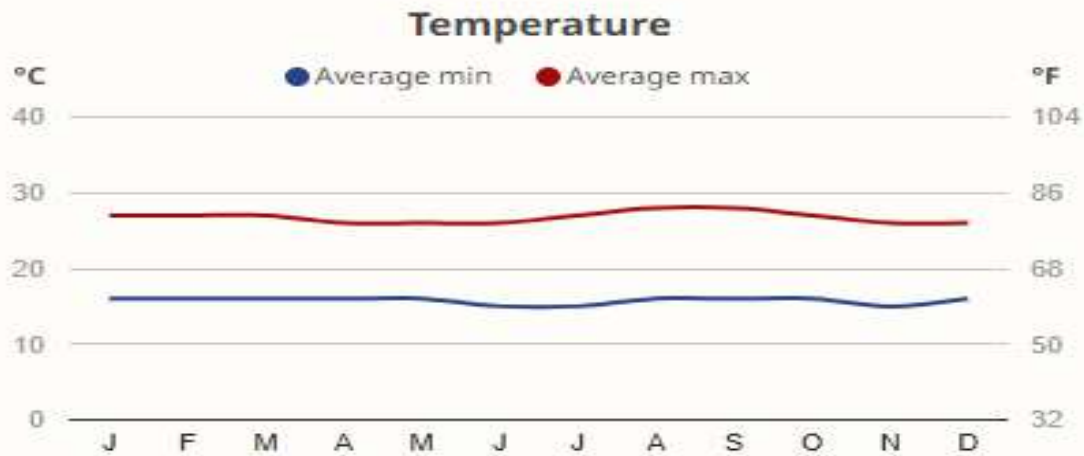


Figure 36: Climate chart Kigali

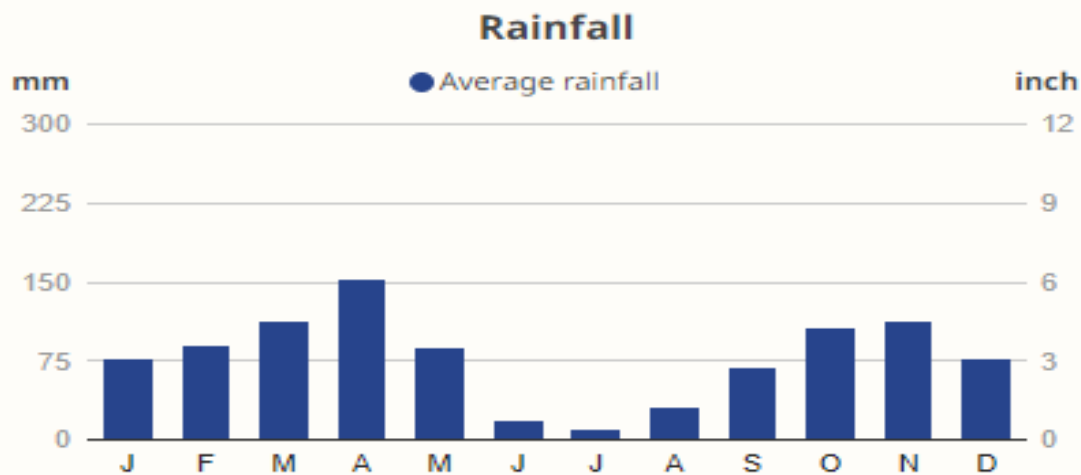


Figure 37: Kigali average rainfall

According to the weather data gathered over the past 30 years⁴⁵, the most favorable time to visit or conduct any project activities in Kicukiro district is between January and March, May through September, and December. During these periods, the weather is pleasant with a comfortable temperature and minimal precipitation. The average temperature in Kicukiro is the highest in January, at 79°F, and the lowest in May,

⁴⁵ <https://www.besttravelmonths.com/rwanda/kicukiro-3483009/>

at 72°F. For more detailed information, a table is provided below, which indicates the average weather conditions in Kicukiro each month, including the monthly temperature and precipitation levels.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature (°F)	79	79	78	74	72	74	78	79	79	77	75	76
Precipitation (inch)	20	27	38	50	38	11	5	13	37	58	61	38

Figure 38: Climate Kicukiro by month

Kigali International Airport experiences a subtropical highland climate, which is characterized by moderate temperatures, distinct rainy and dry seasons, and moderate temperature variations between day and night. The climate is generally comfortable and mild, with heavy rainfall during the rainy seasons and little to no rainfall during the dry seasons. The data presented in the figures below provide information on the average rainfall and temperature at Kigali International Airport.⁴⁶

⁴⁶[https://www.worldweatheronline.com/v2/weatheraverages.aspx?q=kgl&width=220&custom_header=gre goire%20kayibanda%20\(kgl\)%20weather,%20rwanda&title_bg_color=0202](https://www.worldweatheronline.com/v2/weatheraverages.aspx?q=kgl&width=220&custom_header=gre goire%20kayibanda%20(kgl)%20weather,%20rwanda&title_bg_color=0202)

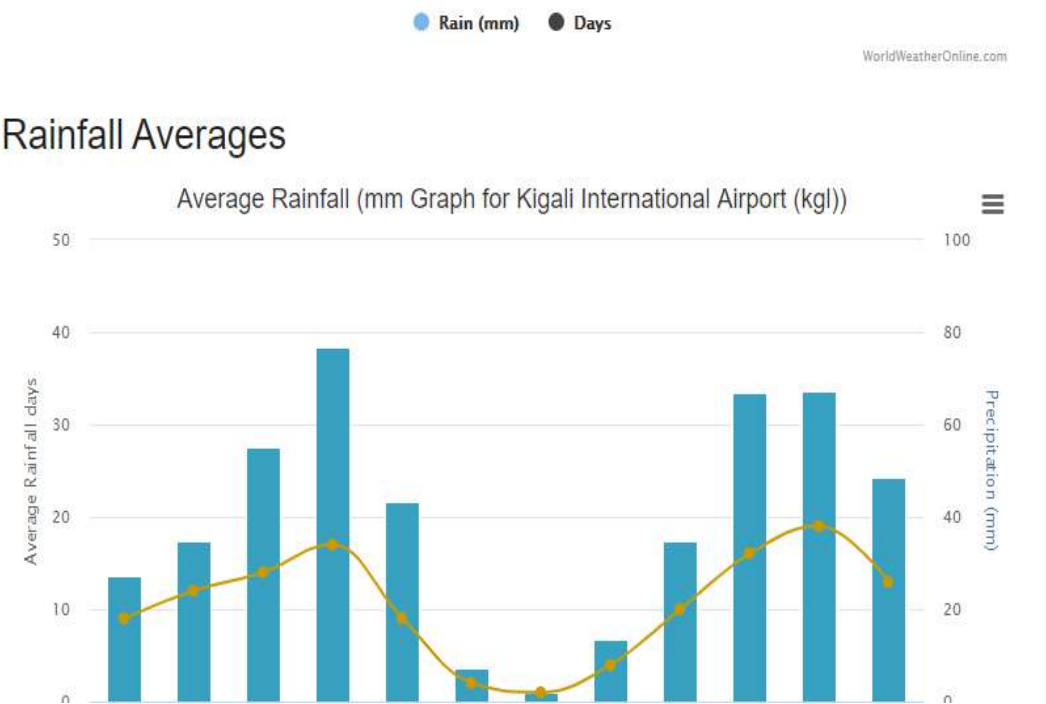


Figure 39 Average Rainfall mm Graph for Kigali International Airport.

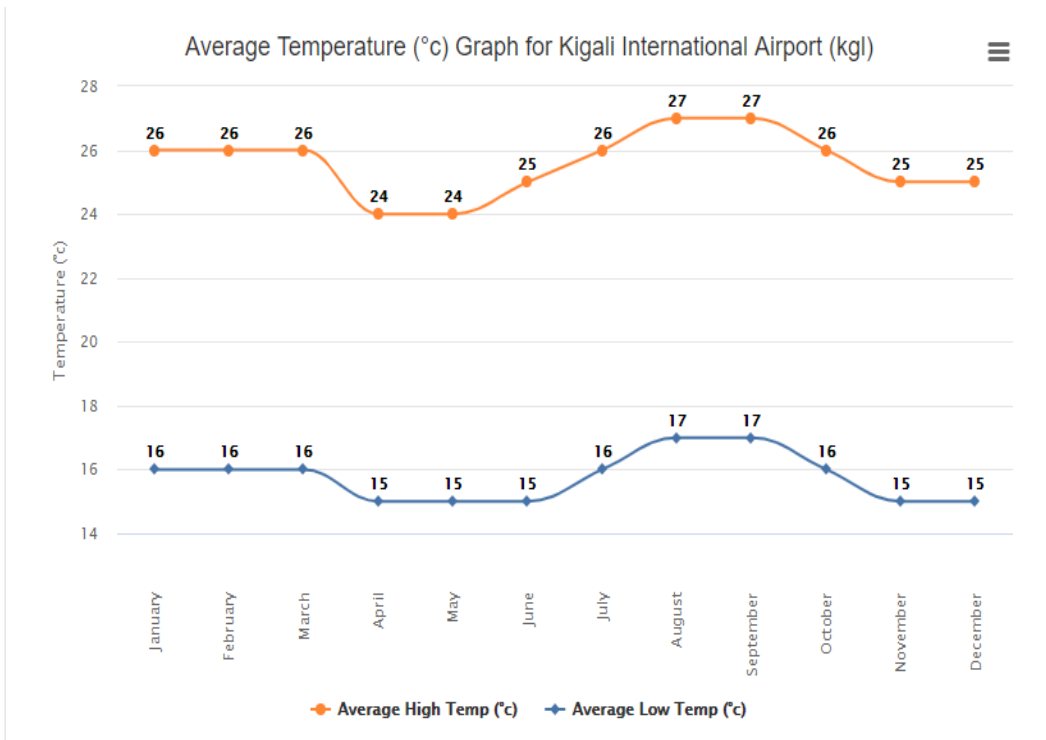


Figure 40: Average Temperature °C Graph for for Kigali International Airport.

4.1.3 Topography

Kigali is very close to the equator, at a latitude of 1° 58'S, and it lies to the east of Africa's center, at a longitude of 30° 07'E. Kigali is built on many hills, sprawling across four ridges with valleys in between. The top-most ridge is 1,600 m in elevation and the valleys are 1,300 m above sea level. At 1,850 m, Mount Kigali is the highest hill. Kigali City is built on hilly landscape sprawling across ridges and wetlands with an altitude varying between 1300-2100m.

The proposed project site is on the hillside at elevation between 1415-1429 m above the sea level, with slopes of about 8 %. The surroundings of the project site is characterized by a mixture of high mountains with average altitude of 1,800 m mainly located in the rural zone of Kicukiro District (GoR, 2013). The geographic coordinates of the plot are shown in Table below.

Table 4: Geographic coordinates of the plot

Point	X (°)	Y (°)	Z(m)
Northeast	1° 57' 21.79"S	30° 09' 31.87"E	1429
Northwest	1° 57' 23.93"S	30° 09' 27.55"E	1422
Southeast	1° 57' 24.52"S	30° 09' 33.14"E	1421
Southwest	1° 57' 26.49"S	30° 09' 28.92"E	1415

The site is a free land with no development within boundaries and connected to 2 existing roads from lower and upper side based on topography. The aviation training center has a steep slope and has two main parts according to the Topography; one part which is flat (on the Top hill) and another part with steep topography which is managed in the design and becomes an opportunity for the center buildings as they are below the level of the KIA runway, therefore the center is not affected by the aircraft sound.





Figure 43: View of the topography within the aviation training center project site

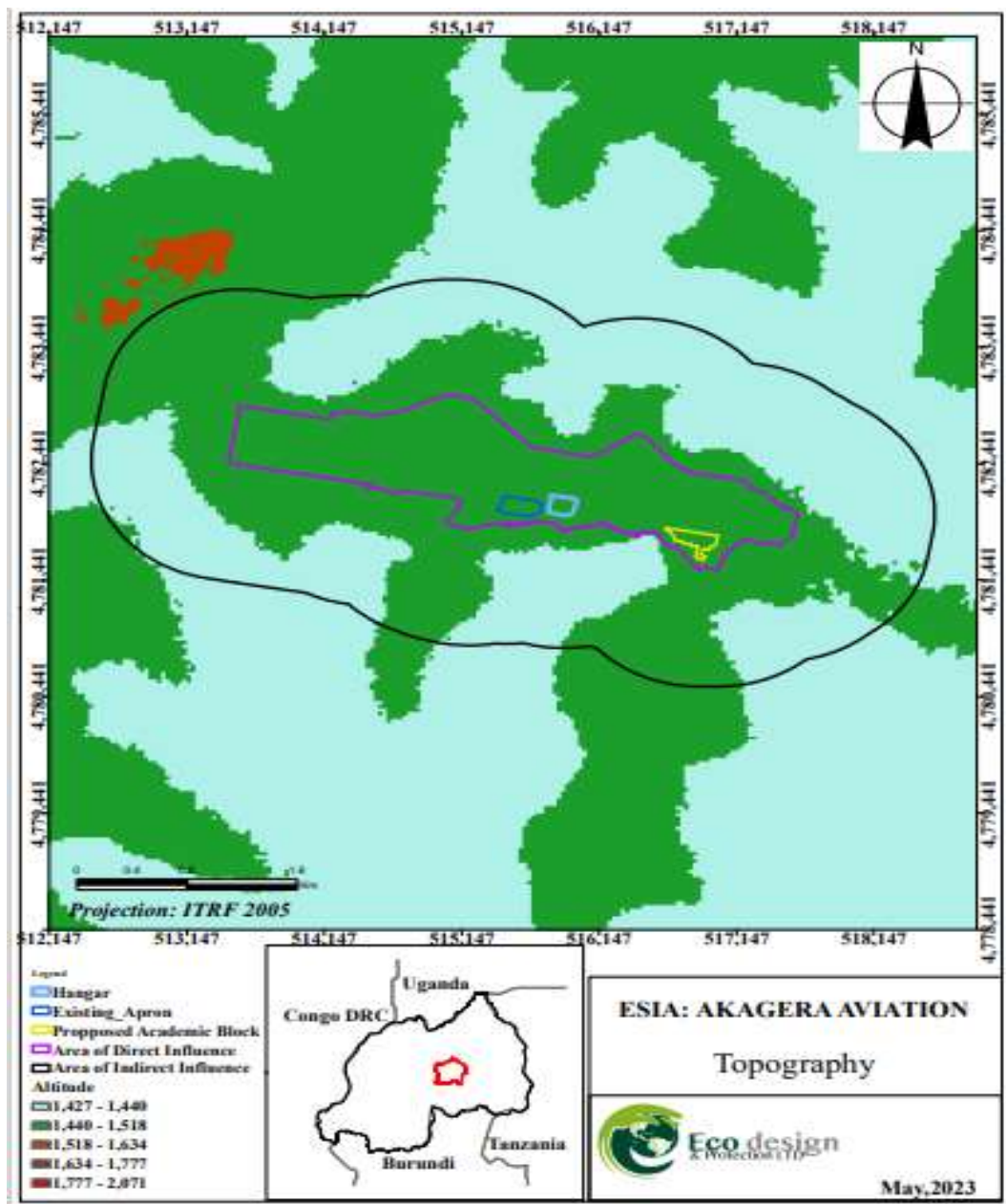


Figure 44: Map showing the topography of the proposed project sites.

4.1.4 Hydrology

Rwanda hydrological network is divided into two main river basins: Nile Basin covering 67 % of the Rwandan territory and draining 90 % of the country's waters and the Congo basin covering 33 % of the Rwandan territory and draining 10 % of the country's water. The pluviometry varies between 800 and 2000 mm per year with 1200mm in average.

Kigali City underlying hydrology is governed by 25 watersheds within the city limits and is part of the Lake Victoria basin. In central and northern Kigali, the topography is relatively steep and drained by the Nyabugogo River, which is the main watercourse in the northwest quadrant. The Nyabugogo is fed by various smaller streams in the city (such as the Yanze, Kibumba, Rwazangoro and Ruganwa), and its

drainage area covers most of the territory of Kigali City. There are some streams that flow directly into the Nyabarongo River from the city's southern hills. The Nyabarongo River is the main watercourse that borders the western and southern edges of the city limits⁴⁷. Wetlands are another of Kigali's key hydrological features, located mainly in the river valleys of the rivers described above; they presently cover about 12.5% of the city's total area. Within the larger project area of indirect influence, the wetland present include the Rubilizi, and the Mwanana-mulindi-kanombe wetlands which serve as natural water purification systems, play a vital role in preventing flooding in the surrounding areas, and are home to a variety of plant and animal species.

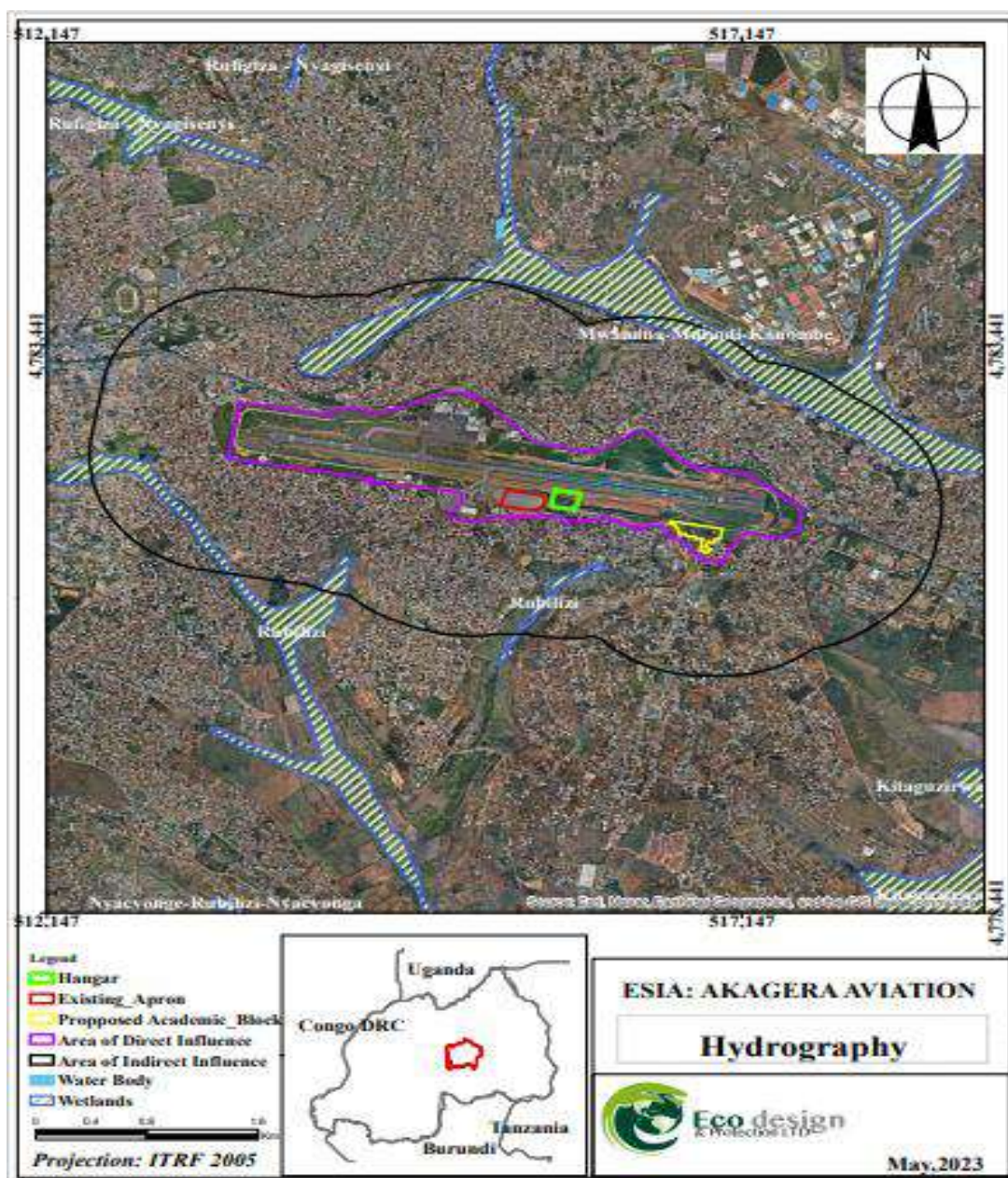


Figure 45: Map showing the hydrology of the project area.

47 REMA (2013) CHAPTER 7: WATER AND WETLANDS RESOURCES, available at: <https://www.rema.gov.rw/soe/chap7.pdf>.

4.1.5 Geology and soils

The geology of Rwanda consists of migmatites, gneisses and mica schists of the Paleoproterozoic Ruzizian basement overlain by the Mesoproterozoic Kibaran Belt⁴⁸. The Meso-Proterozoic formations comprise three lithologies: low-to-medium grade metavolcanic / metasedimentary sequences, large granite batholiths (with inliers of basic and metasedimentary rocks) and large complexes of high-grade metasediments to amphibolite with granite / gneisses and migmatites. (Mining in Rwanda). Cenozoic to Recent volcanic rock occur in the northwest and west. Some of these volcanics are highly alkaline and are extensions from the Birunga volcanic area of southwestern Uganda. Tertiary and Quaternary sediments fill parts of the Western Rift in the western part of the country.

The City of Kigali is underlain by granitic and meta-sedimentary rocks. The degree of metamorphism undergone by the sediments is generally low. Primary rocks observed in the city are schists, sandstones, and siltstones. The surface of the city is dominated by lateritic soil along the hillsides and alluvial soil along the marshlands. There are four general types of soil found in Kigali: lateritic soils, arkosic sands, colluvium (slope wash) and alluvium (river deposits). The valley of Nyabogogo and Nyaborongo River provide a fertile belt of alluvial soil suitable for agriculture whereas the hilly slopes have undergone soil erosion for a long time, leaving them bare and less productive.



Figure 46: Type of soil on site

⁴⁸ <https://sinananewsrwanda.blogspot.com/2018/04/the-general-geology-of-rwanda.html>

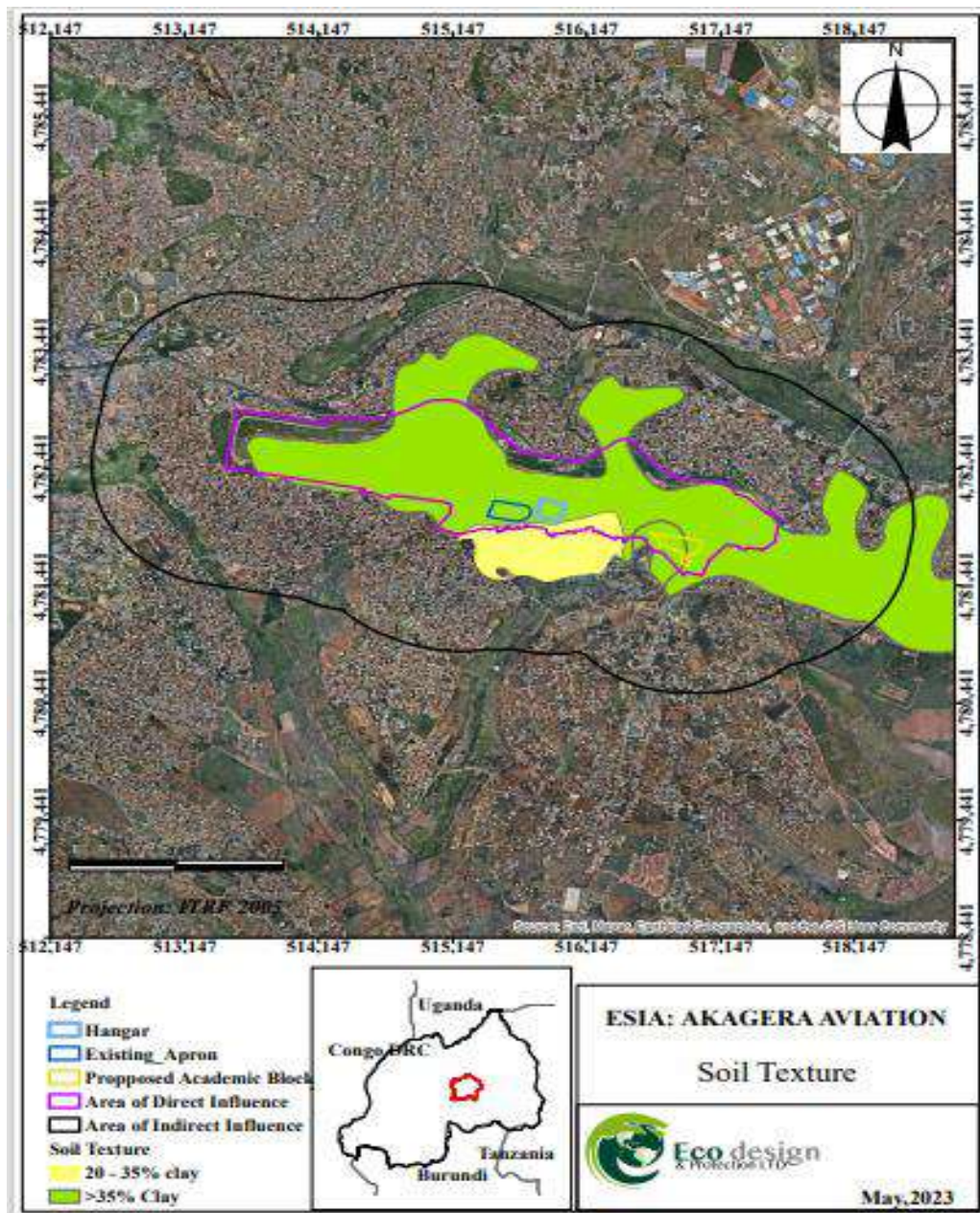


Figure 47: Map showing the types of soil in the proposed project sites.

4.2.6 Ambient air quality

According to an inventory of sources of air pollution in Rwanda (REMA, 2018)⁴⁹, the major sources of ambient air pollution is road traffic emissions, emissions from power generation and industrial sources.

The results indicated that background concentrations of PM₁₀ and PM_{2.5} in Kigali are elevated and are likely to be well above standards used in other countries. A review of the data and the main emissions sources indicates that domestic stoves are likely to be heavily influencing background concentrations, but road traffic also is a large contributor to high PM concentrations near busy roads. In Kigali, particulate matter from vehicular emissions is 133 µg/m³ for PM_{2.5} and 156 µg/m³ for PM₁₀. Generally, these concentrations are far above those recommended by WHO. These high concentrations of particulates in Kigali are the result of high densities of vehicles, particularly old vehicles, inadequate maintenance facilities, poor traffic management systems and road conditions, and lack of mass transport systems e.g., trains.

The results from passive monitoring for NO₂ and SO₂ show that along KN-5 the main road to Kigali international airport reported a concentration of 84 µg/m³ for NO₂ and <4.8 µg/m³ for SO₂. This demonstrates that the high concentration is only located within proximity to the road, clearly demonstrating that vehicles are one of the main sources of pollution in Kigali and that the airport itself is not having a significant impact on NO₂ concentrations. As for residential areas in the same area but set away from the road only recorded a concentration of 24 µg/m³ for NO₂ and <4.8 µg/m³ for SO₂. These findings reflect the ambient air quality of the proposed Aviation hangar and Training academy center project sites.

4.2.7 Ambient noise level

Due to the increasing urbanization and population growth, noise pollution continues to worsen and poses a severe risk to public health. This is especially concerning in developing countries like Rwanda. Based on an assessment⁵⁰ carried out on the effect of land-use type during a two-month period at nine sites: three commercial sites, three passenger-car parking sites, two road junction sites, and one reference site (Car-Free Zone) in Rwanda, results showed that the mean noise levels were higher during weekdays (60–80 dB (A)) than during weekends (50–70 dB (A)), exceeding the World Health Organization permissible daytime limits.

Spatial variation of noise levels interpolated for Kigali City shows higher noise levels (hotspot) in the outskirts of Kigali, Remera and Kimironko. Three noise level hotspots (Remera, Nyamirambo and Kigali City center) were observed during weekdays (37–85 dB (A)), while two noise hotspots sites (Kimironko and Remera) were observed during weekends (60–77 dB (A)). Nyabugogo, Kimironko and Remera, central transportation hubs in the city, fall within the hazardous zone of noise sensitivity during weekdays and the high-risk zone during weekends, which could be attributed to people moving to and from Kigali.

Airports such as the Kigali International Airport, can be noisy places due to the high levels of activity, including the takeoff and landing of planes, ground handling, and airport operations. The noise generated by aircraft engines can be particularly loud, and this can be a concern for people living near airports. The

⁴⁹ Inventory of Sources of Air Pollution in Rwanda: Determination of Future Trends and Development of a National Air Quality Control Strategy.

https://rema.gov.rw/fileadmin/templates/Documents/rema_doc/Air%20Quality/Inventory%20of%20Source%20of%20Air%20Pollution%20in%20Rwanda%20Final%20Report.pdf

⁵⁰ Noise levels associated with urban land use types in Kigali, Rwanda: <https://www.sciencedirect.com/science/article/pii/S2405844022019417>.

noise level of Airbus A320 and Boeing 737-800 type aircraft, which are widely used in the medium category all over the world, is around 93-94 decibels.⁵¹

4.2.8 Seismic activity

According to the National Risk Atlas of Rwanda⁵², for earthquake hazard, the study revealed that Rwanda could have potential intensity varying from MMI V to MMI VII based on two scenarios of 2475-year and 475-year return periods. MMI VII is the highest earthquake intensity recorded in the western part of the country.

Rwandan territory and the Western Rift Valley of Africa (WRA) in general, have experienced severe destructive shallow earthquakes. The western rift system remains the main source of seismic movements impacting the region and Rwandan territory. For Rwanda earthquake hazard is classified as medium according to the information that is currently available. This means that there is a 10% chance that potentially damaging earthquake shaking will take place in the area in the next 50 years.

Except for Butare, no seismographic station was operational in Rwandan until 2013. Therefore, Rwanda Natural Resource Authority installed in early 2014 two additional stations at Ruhengeri (Musanze) and Kigali. However, data collected by those stations are not yet processed. To accurately locate an earthquake, four broadband seismic stations are required and one more station is still lacking. The lack of seismic stations leads to an important uncertainty in the earthquake location on Rwandan territory and so the project site.

⁵¹ <https://www.aviationfile.com/noise-pollution-levels-by-aircraft-types/>
<https://www.aviationfile.com/noise-pollution-levels-by-aircraft-types/>

⁵²National Risk Atlas of Rwanda:

https://www.gfdr.org/sites/default/files/publication/National_Risk_Atlas_of_Rwanda_electronic_version_0.pdf

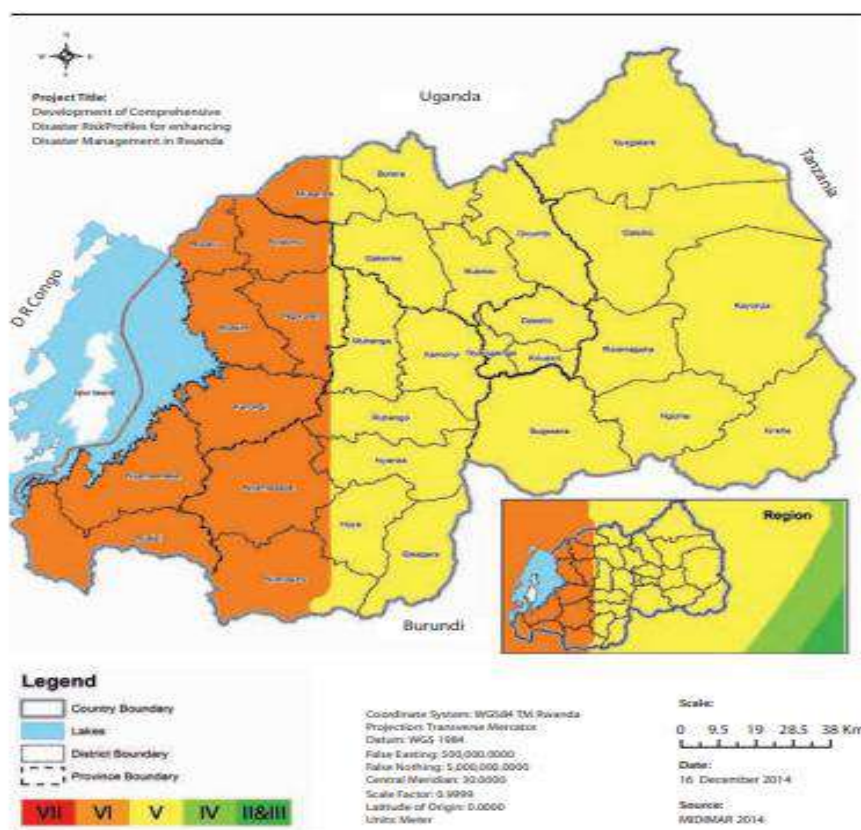


Figure 48: Earthquake hazard zonation map at 10% probability of exceedance in 50 years

According to the above hazard zonation map, Kicukiro district falls in the moderate zone of V MMI range.

Table 5: Earthquake hazard zone scale

Zone	MMI Range	PGA (g) correspondent	Shaking	Description
Very high	VII	0.18 - 0.34	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
High	VI	0.092 - 0.18	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
Moderate	V	0.039 – 0.092	Moderate	Felt by nearly everyone; many awakened. Some dishes and windows broken. Unstable objects overturned. Pendulum clocks may stop.

4.2.9 Land cover

Aircraft hangar site

The proposed location for the aircraft hangar is mostly covered by natural vegetation, mainly grass on a flat landscape. It is located close to various existing features, including an apron for aircraft parking, a WASAC water tank that serves as a reservoir for airport facilities, and taxi lanes that connect the hangar site to critical areas like the runway and terminal buildings. Additionally, the site's boundaries are approximately 189 meters away from the centerline of the current runway. Many weather and other utility instruments for the airport are also in the vicinity of the hangar site.



Figure 49: Land cover of the aircraft hangar site



Figure 50: Instruments in the vicinity of the aircraft hangar site



Figure 51: Drainage structures next to the aircraft hangar site



Figure 52: Existing apron next to the aircraft hangar site

Aviation training center

The suggested site for the aviation training center is located just outside the airport's boundaries. The land on this site has a steep slope and is mostly covered with vegetation, including grass, as well as tall standing trees. Additionally, there are some residential buildings and small, low-quality shops in the area, along with other workshops such as a garage and a car wash. Close to the site, there are some culturally significant places like the Busanza cemetery and a church.



Figure 53: Land cover of the proposed aviation training center site



Figure 54: Garage in the project area of the aviation training center site



Figure 55: Residential buildings next to the aviation training center site



Figure 56: Utilities present in the vicinity of the aviation training center site.



Figure 57: Boundaries of the airport next to the proposed aviation training center site



Figure 58: Drainage structures beneath the proposed aviation training center site

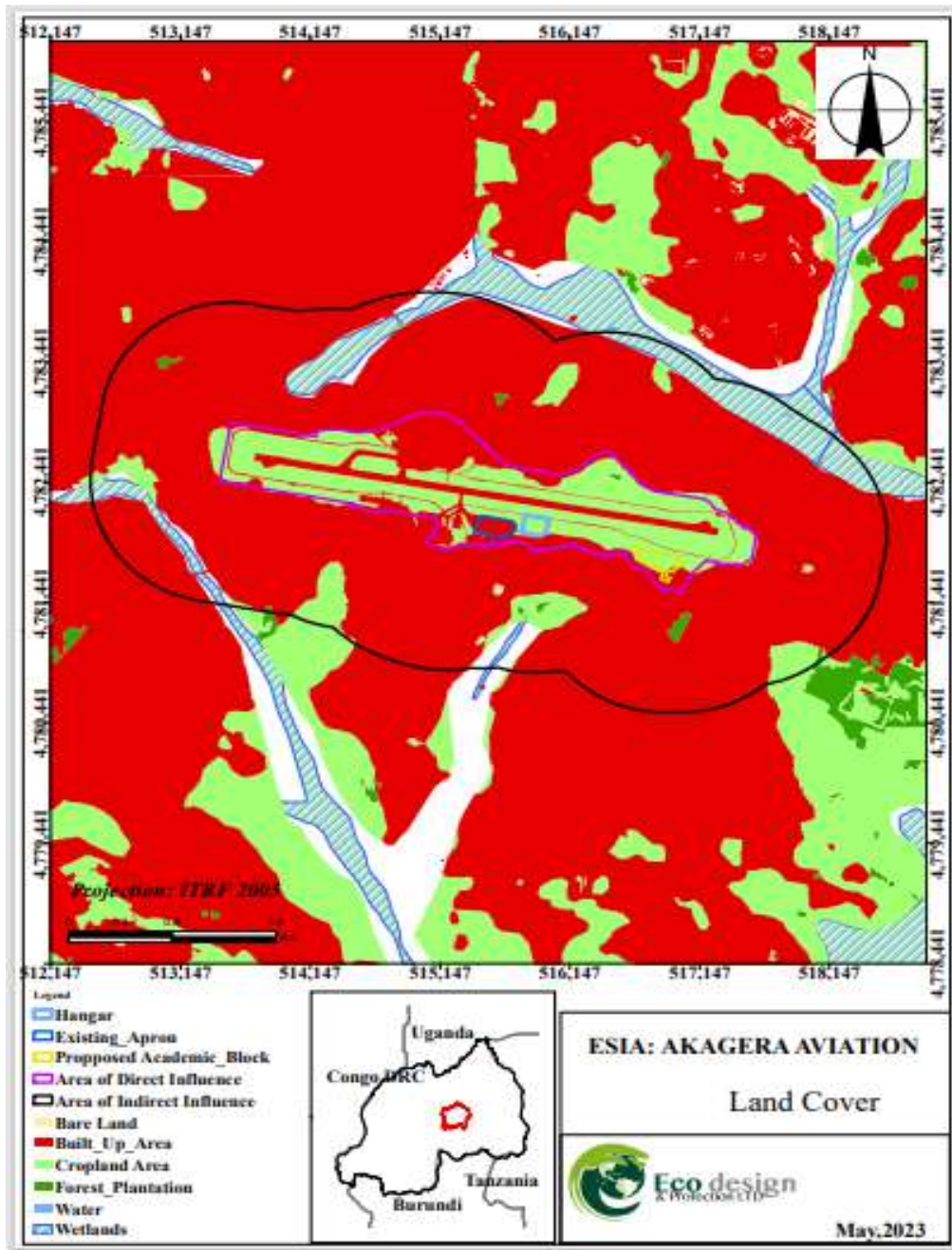


Figure 59: Map showing the land cover of the proposed project sites.

4.3 Biological Environment

4.3.1 Flora

The natural vegetation in Kicukiro district has been largely replaced by smaller plants, with eucalyptus trees being the most common. However, some wild plants can still be found in marshes and uncultivated areas. The district has a diverse flora that includes both native and introduced species such as jacaranda, mango, banana, hibiscus flowers, bougainvillea flowers, acacia, cassava, coffee, sweet potatoes, and eucalyptus trees. In the larger project area, shrubs and rainfed herbaceous crops are the main type of crops that can be grown.

The proposed location for the aircraft hangar is mostly covered by natural vegetation, which is mainly grass growing in a flat landscape. On the other hand, the vegetation found at the aviation training center site consists of grass mostly *Digitaria Abyssinia* and *Melinis repens*, as well as tall standing trees such as *Mangifera indica*, *Grevillea robusta*, *Lantana camara*, *Clerodendrum johnstonn*, *Jacarands mimosifolia*.



Figure 60: Flora present on the proposed aircraft hangar site



Figure 61: Flora present on the aviation training center site

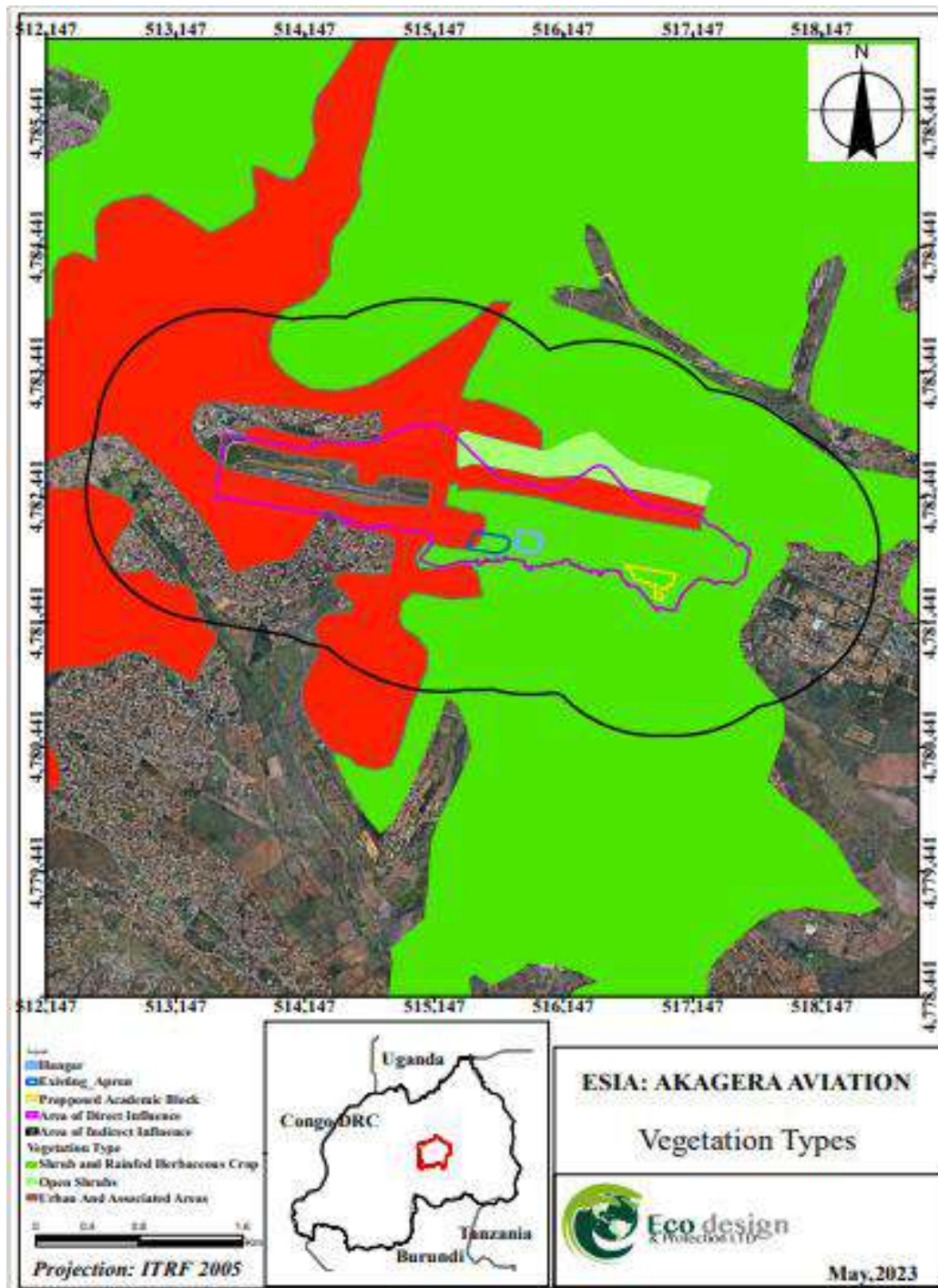


Figure 62: Map showing the vegetation type of the proposed project sites.

4.3.2 Fauna

The Kicukiro area is home to various species of fauna, including birds, reptiles such as snakes, and fish. However, there is no evidence of wildlife in and around the project site. This is likely due to the fact that the area is primarily used for subsistence agriculture activities and is designated as a residential zone. In the past, there were many invertebrates, including *Formica* sps (Ikimonyo), as well as vertebrates such as *Mus*

musculus (Imbeba) rodents and birds such as Motacilla aguimp (Inyamanza) and Passer griseus (Igishwi). None of these animals are listed as protected species.

Within the Kigali international airport, the following bird species are present within a 13km radius. These include:

- Black kite
- Black-headed heron
- House martins
- Owl
- Ibis
- Yellow billed stork
- Plover
- Common kestrel
- African marsh harrier
- Pigeon
- Long crested eagle
- Grey Crowned crane.
- Marabou stork
- Hooded vulture
- African Hawk-eagle
- Pied crow
- Hamerkop
- Swallow
- Bishop.



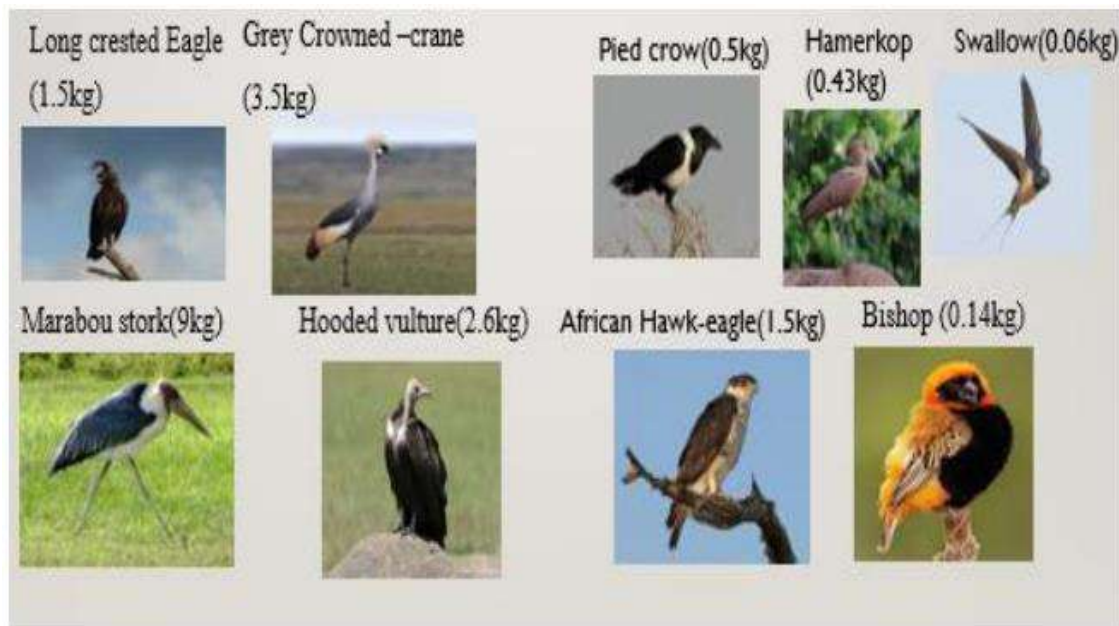


Figure 63: Bird species present at KIA.

Mammal species found at KIA include:

- Stray dogs, cats
- Side-striped Jackal
- Monkey

4.3.3 Critical habitats

Rwanda is endowed with rich biological resources comprised of a great diversity of plants, animals and habitats which make the country unique. The forests in Rwanda have historically played a significant role in the economy and livelihoods of its population. However, these plus the country's other natural ecosystems including, wetlands, rivers, and lakes, together with the biodiversity they host have been degraded by deforestation, encroachment from expansion of agricultural activities, human settlements, grazing, illegal logging, and charcoal production (RoR, 2020b).

4.3.3 Sensitive ecosystems

Sensitive ecosystem is defined in this study as fragile and rare ecosystem within the area. Kicukiro district is located in the Eastern Province of Rwanda and is known for its diverse ecosystems that are home to a variety of plant and animal species. Some of the sensitive ecosystems in Kicukiro district include Masaka wetlands, Nyandungu wetlands, Rwandex wetlands, Rufigiza-Nyagisenzi wetlands. Narrowing down to the proposed project sites, within the larger project area of indirect influence, the wetland present includes the Rubilizi, and the Mwanana-mulindi-kanombe wetlands.

These wetlands serve as a natural water purification system and play a vital role in preventing flooding in the surrounding areas. They also play an important breeding ground for fish and provide a natural habitat for several bird species. Protecting these sensitive ecosystems is critical to maintaining the biodiversity of the area and ensuring the well-being of the local communities that depend on them.

4.4 Socio-Economic Environment

The primary objective of conducting a socio-economic analysis is to assess the potential impact of a proposed development project on the surrounding human environment. This analysis involves examining various factors that affect the socio-economic context of the area, such as land use patterns, population and demographics, and existing infrastructure. This section of the report aims to provide a detailed description of the social and economic conditions of the project area. By understanding the current benchmark of these parameters, it becomes easier to measure and observe the impacts that the proposed project will have on the local community.

To achieve this, the report makes reference to the Fifth Rwanda Population and Housing Census (RPHC5)2022 as well as to integrated household living conditions surveys (EICV4 and EICV5) of Kicukiro District. These data sources offer valuable insights into the population and demographic characteristics, as well as the living conditions and income levels of households in the project area.

By analyzing this information, the report will be able to identify the potential positive and negative impacts of the proposed development project on the local community. For instance, it may highlight the potential benefits of creating job opportunities and boosting economic growth, while also considering any potential negative effects on the environment, public health, or social cohesion. Ultimately, the socio-economic analysis plays a crucial role in ensuring that the proposed project is designed and implemented in a way that maximizes benefits for the local community while minimizing any adverse impacts.

4.4.1 Population and Demography

According to the fifth Rwanda Population and Housing Census (RPHC5), which took place in August 2022, the population of Rwanda was 13,246,394. This figure shows that there was an annual growth rate of 2.3% between 2012 and 2022. The province with the highest level of urbanization is the City of Kigali, with 86.9%. When looking at specific Districts, Gasabo in the City of Kigali has the largest population, while Kicukiro is the most densely populated District in the country.

Table 6: Resident population by sex, Province, District, and population density

Province/ Districts	Counts			Population share (% of the total population) Both sexes	Population density
	Both sexes	Male	Female		
Rwanda	13,246,394	6,429,326	6,817,068	100	503
City of Kigali	1,745,555	888,882	856,673	13.2	2,401
Nyarugenge	374,319	195,780	178,539	2.8	2,830
Gasabo	879,505	443,987	435,518	6.6	2,056
Kicukiro	491,731	249,115	242,616	3.7	2,944

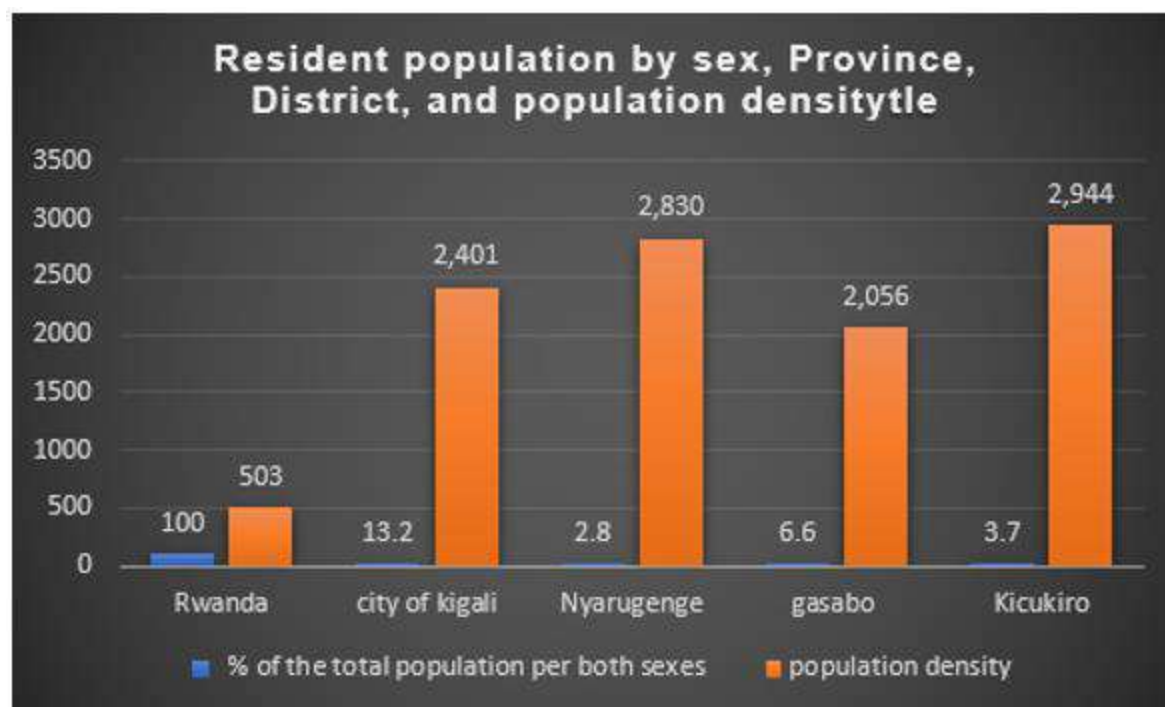


Figure 64: Resident population by sex, province, district, and population density

As of August 2022, the population density of Rwanda has reached 503 people per square kilometer. Looking at population density by sector, there has been a significant change since 2002 and 2012. In those years, most sectors had a population density ranging from under 300 to 500 and from 300 to 600, respectively. However, in 2022, the population density of most sectors has increased considerably and now ranges from over 500 to above 1,000 people.⁵³

⁵³ [RPHC5_MainIndicatorsReport_Final\(1\).pdf](#)

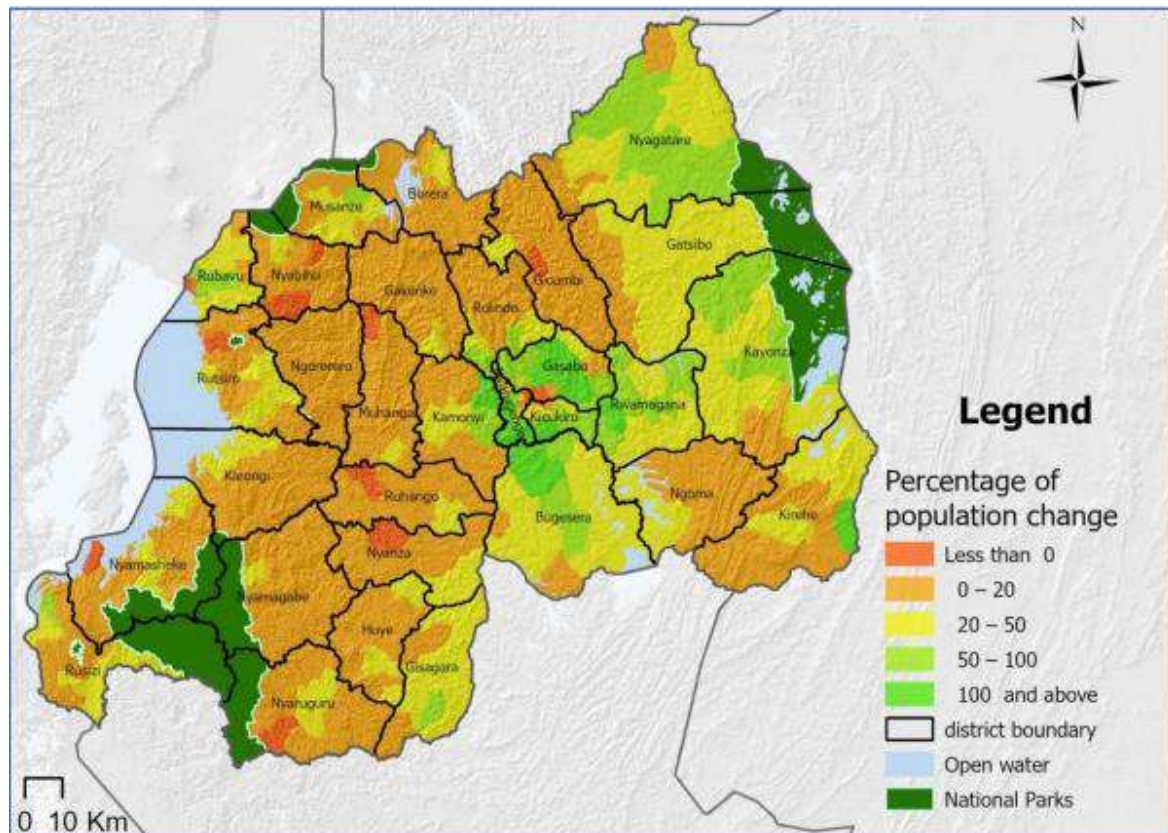


Figure 65: Population change between 2012 and 2022 by sector.

The figure presented above shows that many sectors within the City of Kigali and some districts surrounding it, such as Kamonyi, Bugesera, Rwamagana, and Rulindo, have experienced a significant increase in population, with growth rates of 50% or more. Additionally, Nyagatare and Kayonza have several sectors where the population has increased by 50% or more between 2012 and 2022.

4.4.2 Economic activity and livelihood

The fifth Rwanda Population and Housing Census (RPHC5) provides data on the distribution of employed individuals based on the branch of economic activity they are engaged in, excluding those involved in subsistence agriculture. The census indicates that the majority of employed individuals are involved in market-oriented agriculture, accounting for 53.4% of the total employment. The next significant branches of economic activity are trade, construction, manufacturing, transportation and storage, each employing less than 10% of the total employed population. The remaining branches of economic activity individually make up less than 4% of total employment.

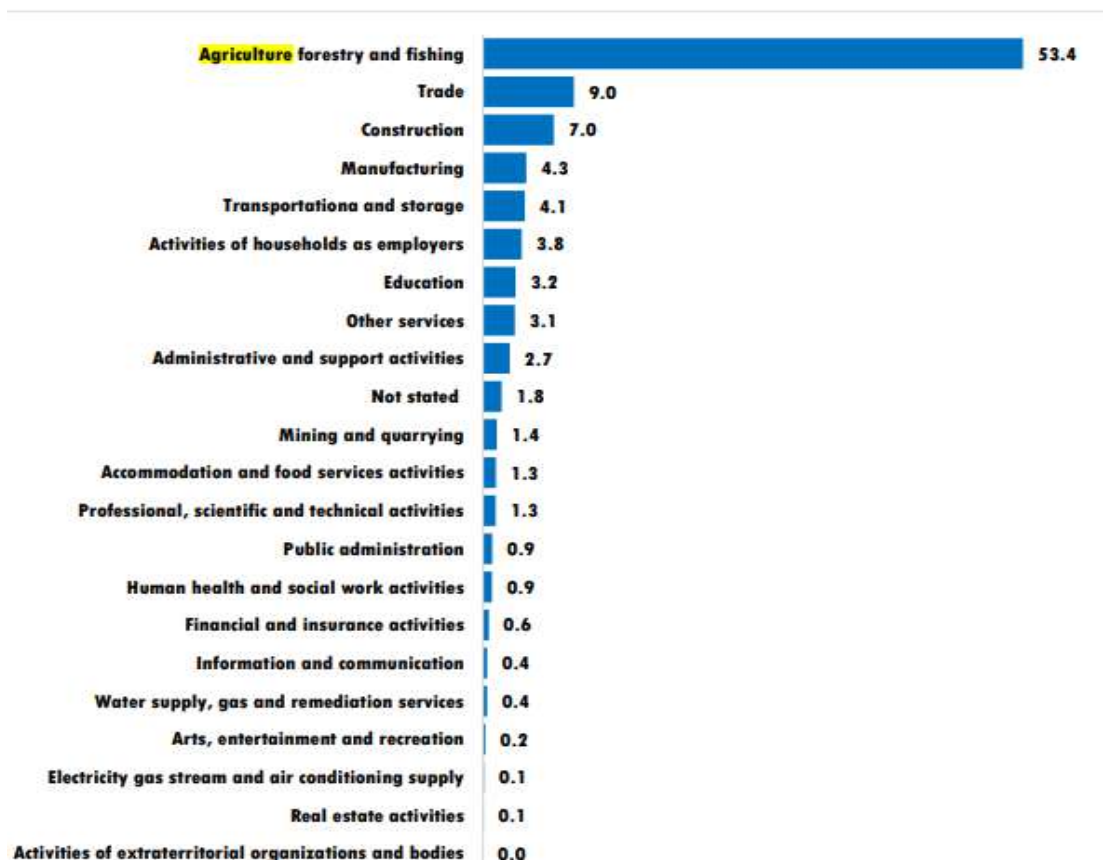


Figure 66: Distribution of employed population by economic activities

Source: Fifth Rwanda Population and Housing Census, 2022 (NISR)

According to the EICV5, the overall working to population ratio of Kicukiro district is 71.9%. The main usual job status of workers in Kicukiro district shows that 66% are employed in non-farm wage jobs, while 8.5% work as independent farmers, and 18.9% work as independent non-farmers. Additionally, 3.7% work in wage farm jobs and 2.9% are unpaid non-farmers.

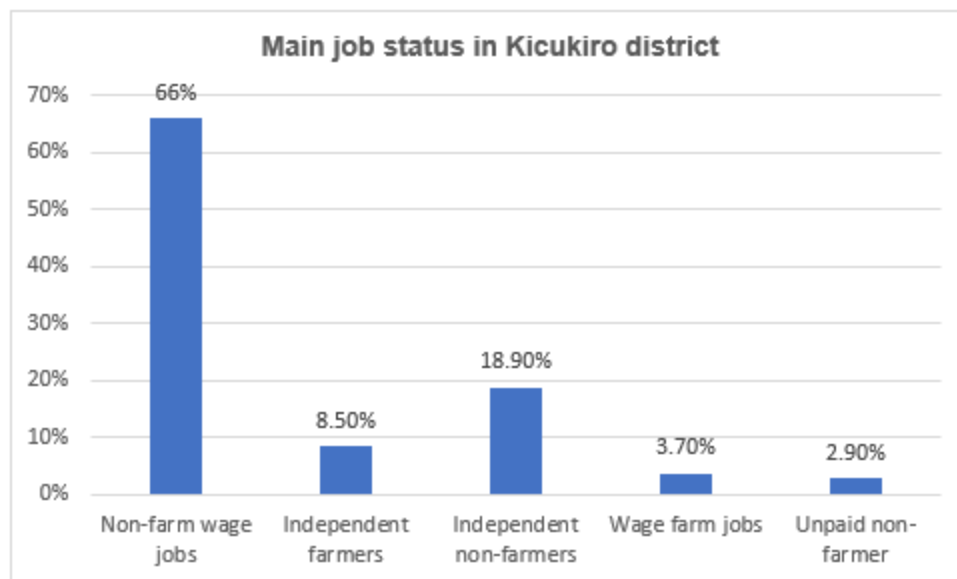


Figure 67: Main job status of workers in Kicukiro district

In terms of education levels, 47% of workers have completed primary education, 16% have completed lower secondary education, 26% have completed upper secondary education, 9% have post-primary education, and 33% have a university level education.

The majority of workers in the district are engaged in the service sector (166), followed by industry (46), and agriculture (53). The working age population in Kicukiro district of male and female is 137 and 136 respectively. Men work on average 51 hours per week, while women work on average 47 hours per week. Kicukiro district has a well-developed financial sector, with most banks, microfinance institutions, and insurance companies having branches in the area. Almost all adults in the district (97%) are included in the financial sector.

4.4.3 Poverty

The main indicator report for Rwanda reveals that the average poverty rate in the country is 38.2%, with an extreme poverty rate of 16.0%. These figures vary across different areas, with urban areas experiencing lower poverty rates compared to rural areas. Specifically, the percentage of the population living below the national poverty line is 38.2% for the country as a whole, 15.8% for urban areas, and 43.1% for rural areas. Similarly, the percentage of the population living below the extreme poverty line is 16.0% for the country as a whole, 5.9% for urban areas, and 18.1% for rural areas⁵⁴.

Meanwhile, the fifth Integrated Household Living Conditions Survey (EICV5) shows that the poverty and extreme poverty rates in Kicukiro district are lower than the national averages. The poverty rate in Kicukiro district is reported at 11.4%, with an extreme poverty rate of 3.5%. This indicates that poverty reduction efforts in the district have been relatively successful, though more work needs to be done to address the root causes of poverty and ensure sustainable development⁵⁵.

In conclusion, reducing poverty and extreme poverty rates remains a key priority for Rwanda's development agenda. The findings of the main indicator report and the EICV5 highlight the need for evidence-based

⁵⁴ <https://www.statistics.gov.rw/publication/eicv-5-main-indicators-report-201617>

⁵⁵ <https://www.statistics.gov.rw/publication/eicv5-district-profiles>

policies and programs that address the specific needs of different groups within the population and promote inclusive growth. By doing so, Rwanda can continue to make significant strides towards achieving its development goals and improving the well-being of its citizens.

4.4.4 Archeology and culture heritage

In the larger area of indirect influence of the proposed project site, there are two remarkable cultural and historical landmarks of significance. One such site is the Busanza cemetery located near Kigali International Airport, eastward in Busanza sector. Another notable cultural site nearby is the Rwanda Art Museum, housed in the former presidential residence close to the Kanombe military hospital.

4.4.5 Health

Medical insurance is a way of paying for some or all of the costs of health care. It protects insured persons from paying high treatment costs in the event of sickness. Often, the basic health insurance process is as follows: a customer makes a regular payment to the managing institution. This institution is responsible for holding the payment in a fund and paying a health care provider for the cost of the customer's care. There are three main groups involved; customers, managing institutions (usually described as third-party institutions) and health care providers. The outcome of the process is that the costs of an individual customer's health care needs are met.

The current official policy of universal access to health in Rwanda includes through, among others, universal access to medical insurance. The figure below shows that good progress has been made in that direction as 97% of the population has medical insurance. There are slight variations by province (96% in the City of Kigali and 99% in the Northern province) and by District (from 95.4% in Nyarugenge, City of Kigali to 99.7% in Gakenke, Northern province).

Table 7: Prevalence of medical insurance by city of Kigali, residence, and sex

Province/ District	Total			Urban			Rural		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Rwanda	97.3	97.1	97.5	96.7	96.5	97.0	97.5	97.3	97.6
City of Kigali	96.1	95.7	96.4	96.0	95.6	96.4	96.3	96.1	96.4
Nyarugenge	95.6	95.3	95.9	95.5	95.0	96.0	96.2	96.6	95.7
Gasabo	96.4	96.0	96.7	96.4	96.0	96.8	96.3	96	96.6
Kicukiro	95.9	95.5	96.3	95.9	95.5	96.3	94.9	94.3	95.6

Mortality indicators are crucial in assessing the health and socioeconomic status of a nation. Over the last 44 years, Rwanda has undergone significant socioeconomic and health advancements, which is evident from the changes in life expectancy at birth. Life expectancy at birth is the most reliable health indicator for a population. Between 1978 and 1991, the life expectancy at birth improved from 46 to 54 years, but it declined from 54 to 51 years between 1991 and 2002, before substantially increasing to 64 in 2012. According to the latest Rwanda Population and Housing Census (RPHC5), the life expectancy at birth has risen to 69.6 years in 2022. The findings further indicate that females have a higher life expectancy at birth of 71.2 years compared to males, whose life expectancy is 67.7 years.

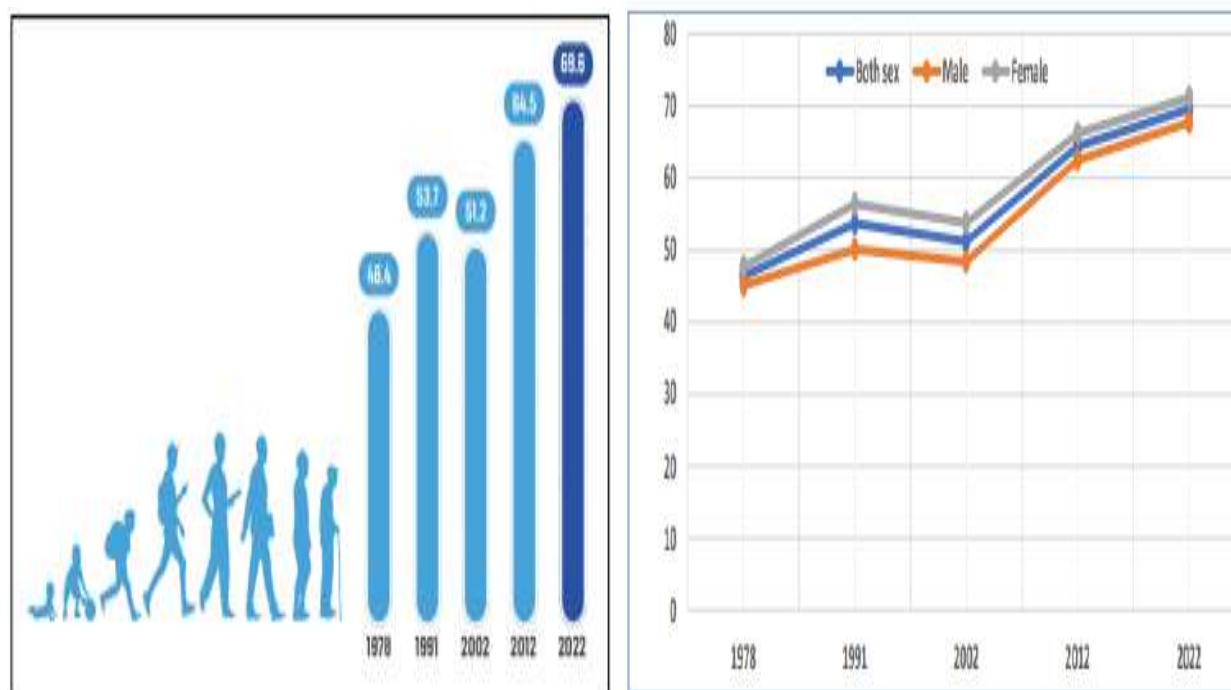


Figure 68: Evolution of life expectancy at birth between 1978 and 2022 by sex

Source: Rwanda Population and Housing Censuses, 1978, 1991, 2002, 2012, 2022 (NISR)

As portrayed by the Kicukiro 2018-2024 Kicukiro District Development Strategy (DDS), the district currently has 22 Public health facilities which include hospitals, health centers, and health posts. In the year 2017/18 99.6% were covered with health insurance. Infant mortality rate reached 32 out of 1000, while the reduction in incidence of HIV/AIDS was 6.6%. The Modern contraceptive prevalence rate (15-49) was 46%. In 2016, 134.4 out of 1000 households were equipped with mosquito nets.

Kicukiro district is home to numerous hospitals and health centers that offer medical services to the local community. Some of these facilities include Rwanda Military Hospital, Legacy Clinics, Nanuri Medical Center, Shema clinic, Kicukiro health center, trinity medical clinic, Gatenga health center, Masaka hospital, saint-vincent palloti and Dothan clinics, health centers and pharmacies and others, which enhances access to medical care thus improved health standards for the people in the surrounding areas. Country wide it takes 49.9 minutes on average as walking distance to these health facilities. This walking distance to basic services can be considered as an indicator of both provision/coverage of such services and the remoteness of households' dwellings.

4.4.6 Education

The current education law, the official school age is 6 to 11 years for primary and 12 to 17 years for secondary. These age ranges were respectively 7 to 12 years and 13 to 18 years for primary and secondary during the 2012 Rwanda population and housing census.

Overall, 22% of the population has never attended school while more than half of the population have primary education level (54%); 15% have secondary while 3% have reached university education. Level of educational attendance varies both by sex and area of residence: Urban residents have higher level of education compared to rural residents, 18% of people in urban areas never attended school compared to

24% in rural areas of Rwanda. The proportion of Females that never attended school is greater than the Males one: 23% compared to 21% for males. Moreover, the proportion of males with university level of education is higher than the one of females (3.8% vs 2.8%). Gender difference among those who never attended school is more observed in the rural than in urban areas.

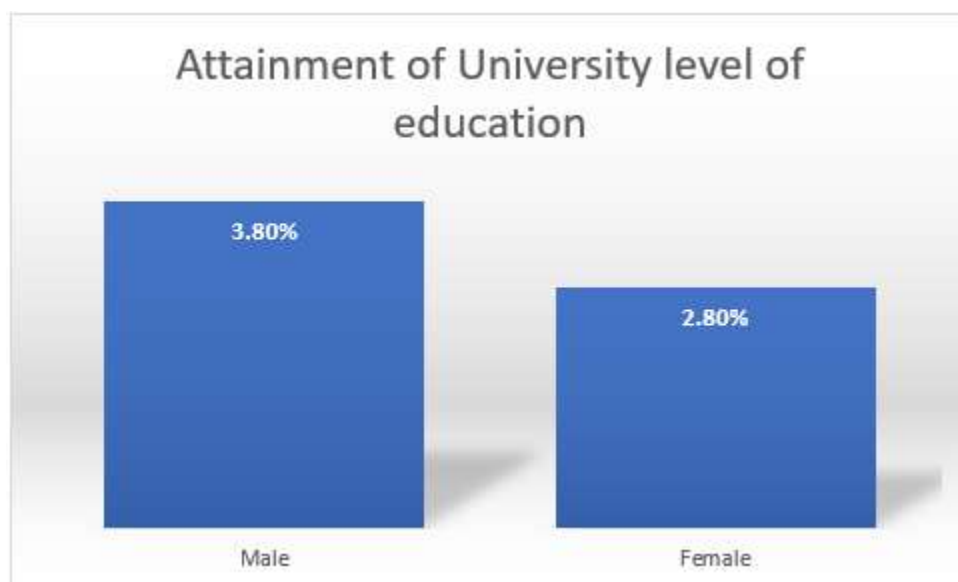


Figure 69: Gender difference in attainment of university level of education in Kicukiro district.

The proportion of the population who never attended school decreases to 16.4% if we consider the population aged 3 years and above.

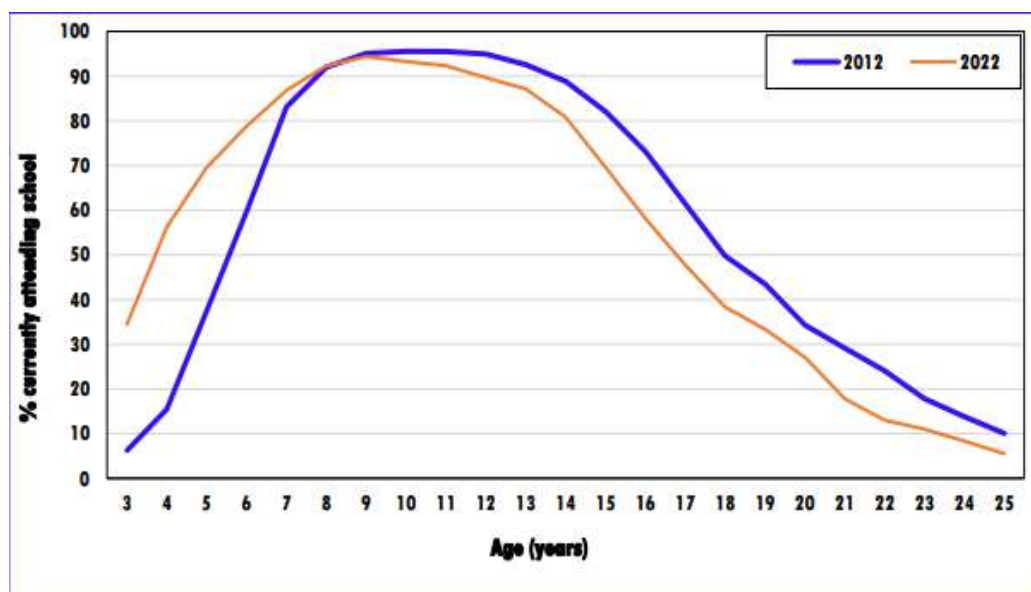


Figure 70: Percentage of the population currently attending school by single age (2012 and 2022)

Table 8: Percentage of children aged 7-12 years currently attending school by sex and residence.

Province/ District	Total			Urban			Rural		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Rwanda	91.4	90.3	92.5	93.5	92.9	94.1	90.7	89.5	91.9
City of Kigali	93.3	92.7	94.0	94.1	93.6	94.6	89.6	88.1	91.1
Nyarugenge	94.5	94.0	95.1	94.7	94.3	95.2	93.6	92.6	94.5
Gasabo	92.5	91.8	93.1	93.7	93.4	94.1	88.5	86.8	90.1
Kicukiro	94.1	93.5	94.8	94.2	93.5	94.8	90.5	90.6	90.3

Kicukiro district hosts numerous schools that cater to the educational needs of the local community. These schools include Trinity Nursery School/Gardienne, Students Parents Association, Rwiza Primary School, Rwimbogo Primary School, Kigali Christian Academy, Agape Primary School, Authentic International Academy Kigali, Royal Kids International School, King David Academy, and others. Some of these schools are located in proximity to Kigali International Airport. The district has both public and private schools that offer primary and secondary education, with qualified educators providing quality education to students. The educational sector in Kicukiro district has played a vital role in promoting literacy and education access to the local community.

4.4.7 Land use

Based on the Kigali Master Plan 2020, the proposed site for the hangar project is located inside the Kigali international airport and is categorized as T-Transportation zone. Moreover, a section of the Aviation training center project site is within the airport buffer zone, classified as P1-parks and open spaces. This zone is established around airports to ensure the safety and security of aviation operations. Additionally, another portion of the project site is classified as the Low-Density Residential Densification Zone (R1A).



Figure 71: SITE - Aerial Image indicating the aircraft hangar plot.

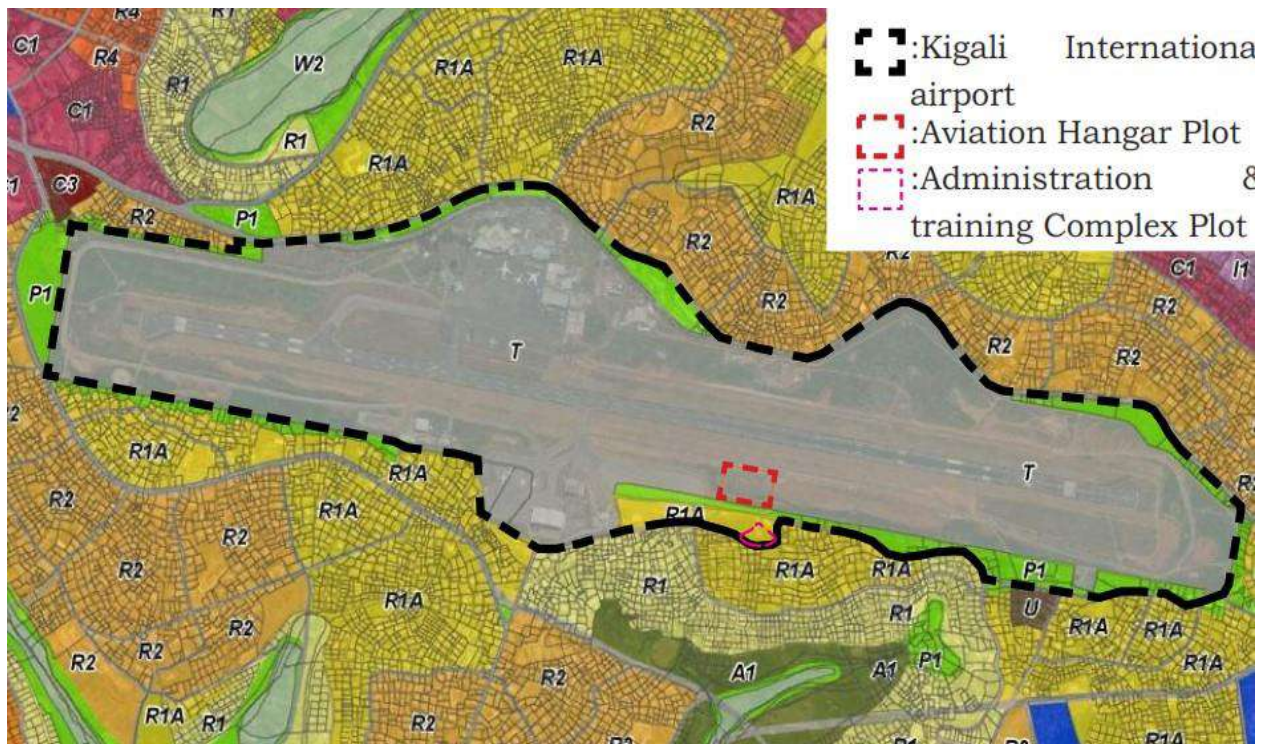


Figure 72: Zoning Map for the proposed aircraft hangar site



Figure 73: Zoning Map for one part of the aviation training center site located in the KIA buffer.



Figure 74: Zoning Map for the other part of the aviation training center site located in R1A



SITE PLAN
1:1500

Figure 75: Proposed Site master plan for the aviation training center site

4.4.8 Infrastructure

The data presented is taken from the 2022 Fifth Population and Housing Census in Rwanda and a socio-economic survey done specifically for households in the project location.

4.4.8.1 Energy

Energy for lighting

In Rwanda, 61% of private households have access to electricity. In Kicukiro district specifically, 92.9% of households have access to electricity.

For lighting, the main energy sources used by households in Rwanda are electricity from REG (47%), Flashlight/Phone Flashlight (28%), and Solar power (14%). In Kicukiro district, the distribution of households by primary source of lighting energy is as follows: 91.5% use electricity from REG, 1.4% use solar power,

0.1% use generators/batteries, 0.4% use kerosene/paraffin/lantern lamps, 3.1% use candles, 0.1% use firewood, 3.2% use flashlights/phone flashlights, and 0.1% use other sources.

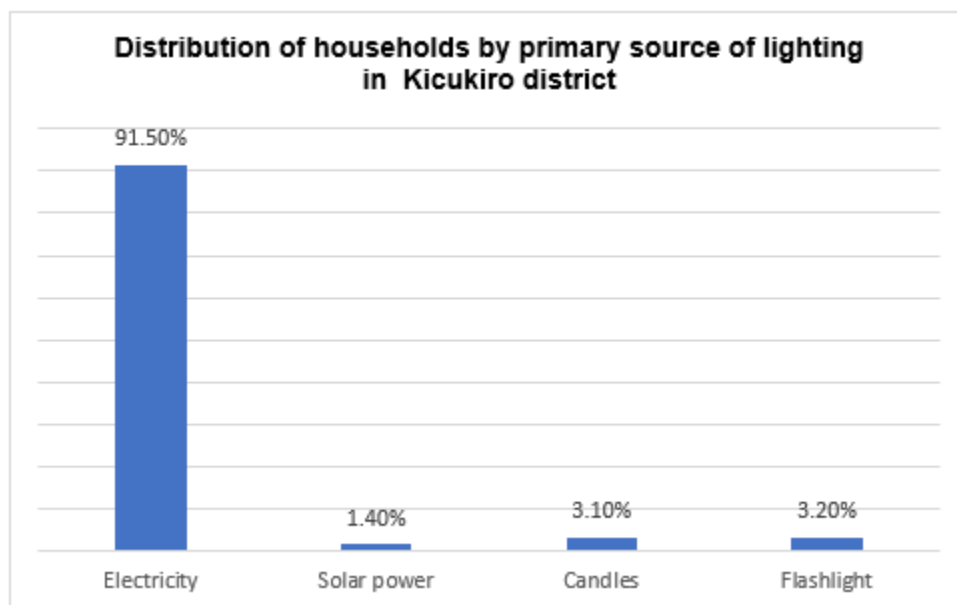


Figure 76: Distribution of households in Kicukiro by main source of lighting energy

At present, airport facilities rely on REG, the national grid, to supply power for lighting purposes. However, there is already a transformer situated within the airport premises which helps to reduce the reliance of the facilities on the public power distribution system.

Energy for cooking

On a national scale, the primary sources of cooking energy for private households are firewood (76%), charcoal (17%), and gas (5%). In Kicukiro district, 13.6% of households use firewood, 57.4% use charcoal, 26.2% use gas, and 0.2% use other sources.

Approximately one third of households (32%) at the national level have and use energy-saving stoves, with a higher prevalence in rural areas (39%) compared to urban areas (16%). In Kicukiro district, 6.9% of households use energy-saving stoves.

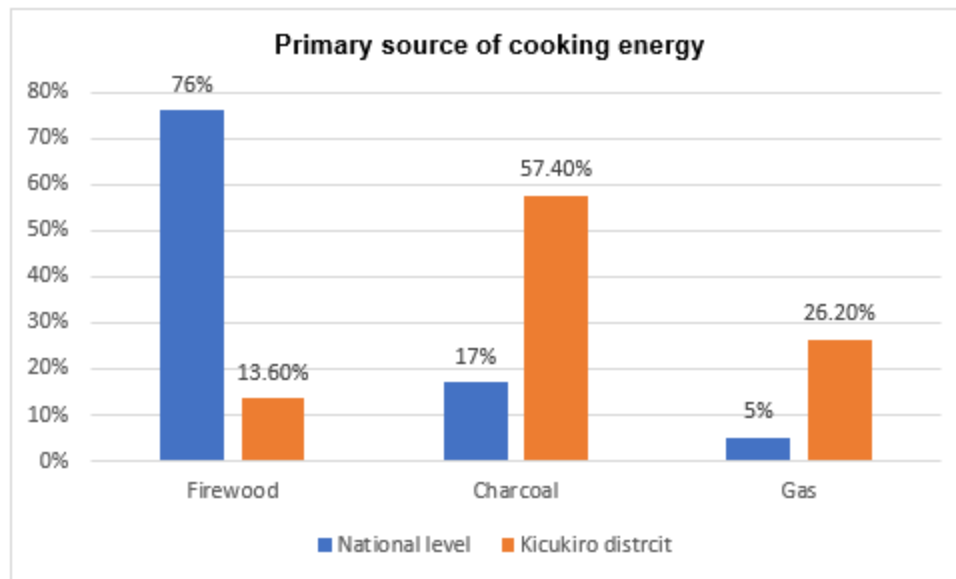


Figure 77: Distribution of households in Kicukiro district by main source of cooking energy

4.4.8.2 Water availability

In Rwanda 82% of the private households use water from improved drinking water sources (pipe borne water, protected spring/well, public tap, tube well and rainwater). 99.1% of private households in Kicukiro district have access to improved drinking water, which is above the national average.

Currently, within the airport premises, there is a water reservoir that functions as the airport's water supply and distribution system. It guarantees a continuous water supply to the airport independently, without relying on the public water distribution line.



Figure 78: WASAC water tank next to the proposed aircraft hangar site.

4.4.8.3 Waste management facilities

Solid waste management

In Rwanda, the main modes of solid waste disposal used by the private households are the compost dumping (more than half), thrown in the household's fields or bushes (around a third) and Waste collection companies (one out of ten).

As for Kicukiro district, private households dispose waste by the following modes: 4.1% through public compost dumping, 15.1% through household compost dumping, 58% through waste collection companies, 21.7% throw in the household's fields or bushes, 0.2% burn their wastes, 0.1% dispose in a river/ stream/ drain/ gutter/ lake, 0.7% by other modes, 0.3% not shared.

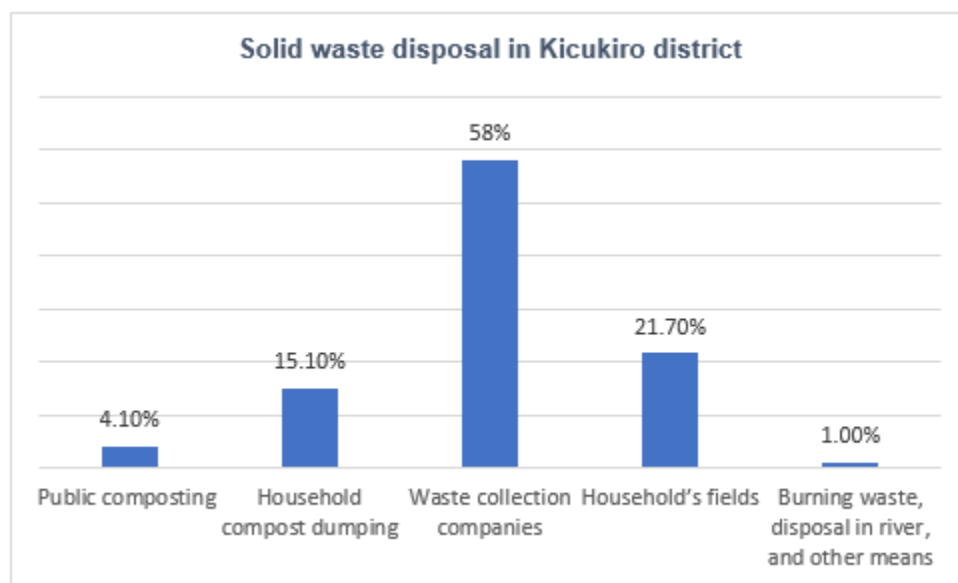


Figure 79: Distribution of households in Kicukiro district by main solid waste disposal means.

Liquid waste management

In Rwanda, the private households use several modes of sewage disposal. The main ones are disposal in the courtyard (45%), bush (19%), Cesspool (18%), Sump (8%), and Main sewer (6%), while other mode of sewage disposal (Rivulet/Trench/Channels, street,) are used by less than 5% of the households.

As for Kicukiro district, the distribution (%) of the private households by main mode of sewage disposal is as follows: 6% in the sump, 12.8% in the courtyard, 1.1% in the rivulet/ trench/ channels, 0.9% in the street, 8.4% in the main sewer, 59.4% in the Cesspool, 4.8% in the bush, 0.6% by other means.

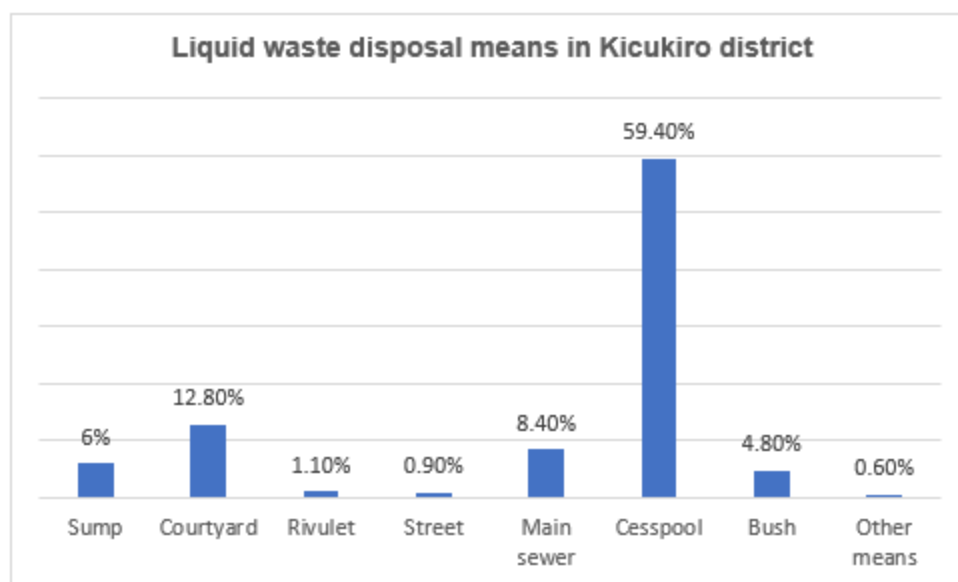


Figure 80: Distribution of households in Kicukiro district by main liquid waste disposal means.

Narrowing down to the proposed hangar site, the site is within the existing Kigali International Airport, which has a comprehensive waste management system and procedures.

4.4.8.4 Communication

The extent of mobile phone and internet usage is an important measure that contributes to the overall knowledge level of the population. The census night's reference period for internet usage is 12 months, and the usage data pertains only to individuals living in private residences.

Nationally, 14% of individuals aged 10 and over, used the internet in the 12 months leading up to the census. The percentage of internet usage increases with age, with 16-17% of those aged 16 and above, and 21 and above using the internet during the same period. The City of Kigali has the highest percentage of internet access among its population, surpassing all other provinces combined. In Kicukiro district, 48.2% of individuals aged 10 and over, used the internet, with 52.5% and 55% for those aged 16 and above and 21 and above, respectively.

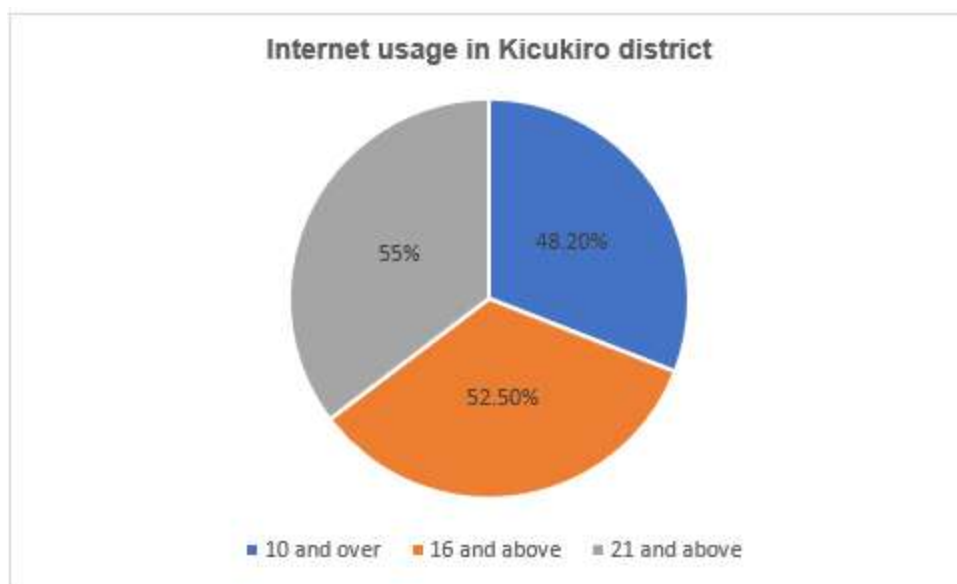


Figure 81: Trends in access to internet services in Kicukiro district.

Regarding mobile phone ownership, 78.1% of households across the country have at least one member who owns a mobile phone. In Kicukiro district, this figure is higher at 94.3%.

According to these results, it can be inferred that a significant number of households in the district have the convenience of using internet and mobile phones, which is higher compared to the national average. This indicates that people living in this area have relatively better access to modern technology, which has become an integral part of everyday life. The prevalence of these technologies within the district suggests that the local community is likely to be more connected and better equipped to communicate and stay informed.

The aforementioned statement applies to both the present Kigali International Airport, where the planned aircraft hangar will be located, as well as the adjacent area beyond the airport boundaries designated for the proposed aviation academy training center. The airport's current operations reveal that there are ample means of communication, including access to mobile phones and internet services.

4.4.8.5 Transport

Within Kicukiro district, there are several modes of transport available including public buses connecting the district to other parts of the city, taxis, motorcycles, walking and cycling, private cars. According to the 5th RPHC, 11.7% of private households own vehicles, 2.7% own motorcycles, and 7.8% own bicycles.

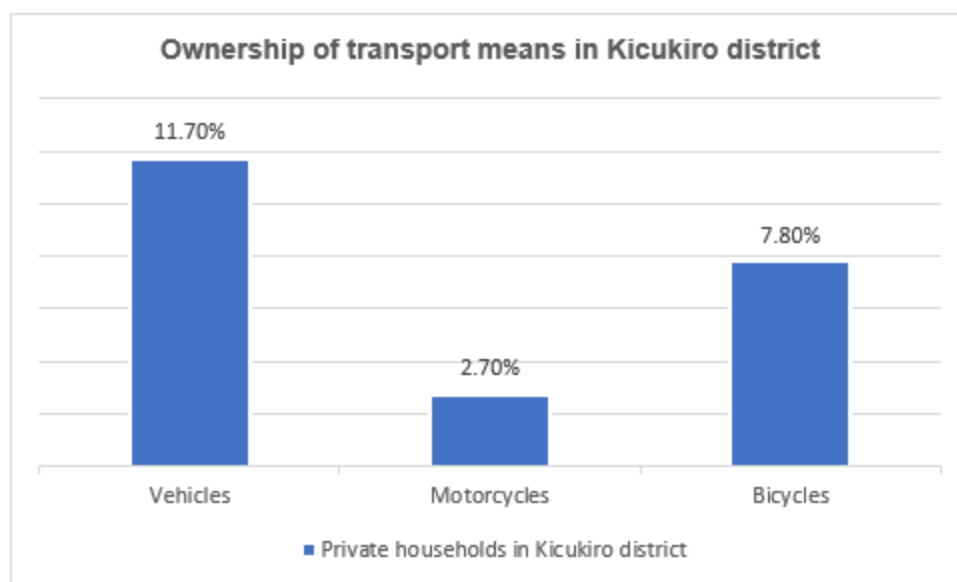


Figure 82: Distribution of households in Kicukiro district by ownership of transport means.

The district has got a good urban and rural network: its sectors, cells are well connected to the boarding districts and the intra district road network connects the district sectors, cells, and villages with each other. The population which is living at less than 20 minutes from all-weather roads is estimated at 99.3%. 55.3 km of roads are in good condition.⁵⁶

The access road to the proposed aircraft hangar is via KN5 road through the existing airport access/entrance points. As for the proposed aviation training center, access to the site can be via KK 180 St or KK 201 St.

4.4.9 Traffic trends

The KMPU Interim Master plan traffic report⁵⁷ utilized traffic counts to identify the highest volume of traffic during peak hours in the morning and afternoon. This information was then used to evaluate the capacity of intersections. Specifically, in the Kigali International Airport (KIA) area, where the proposed project will be located, five intersections along the KN5 major arterial road leading to the airport were studied. The report recorded peak traffic periods during the morning and afternoon. The following peak periods were observed:

- The peak period for intersection 1 (KK103 St/ KK 5 Ave) occurred between 06:45 AM and 07:45 AM as well as between 17:00 PM and 18:00 PM. The highest volume occurs at 07:30 AM and 17:15 PM.
- The peak period for intersection 2 (KN5/KK3) occurred between 06:45 AM and 07:45 AM as well as between 17:00 PM and 18:00 PM. The highest volume occurs at 07:30 AM and 17:30 PM.
- The peak period for intersection 3 (KN5/ KG109) occurred between 06:45 AM and 07:45 AM as well as between 17:00 PM and 18:00 PM. The highest volume occurs at 08:15 AM and 18:00 PM.

⁵⁶Kicukiro District Development Strategy, 2018-2024: <https://knowledge-uclga.org/IMG/pdf/kicukirodistrict.pdf>

⁵⁷ Traffic Report Kigali Master Plan 2050: <https://gis.kigalicity.gov.rw/portal/sharing/rest/content/items/664c4548e60541a5a99ce0cdb2cfd697/data>

- The peak period for intersection 4 (KN3/KN5) occurred between 07:15 AM and 08:15 AM as well as between 17:00 PM and 18:00 PM. The highest volume occurs at 08:00 AM and 18:00 PM.
- The peak period for intersection 5 (KN 5/ KG1) occurred between 07:30 AM and 08:30 AM as well as between 17:00 PM and 18:00 PM. The highest volume occurs at 08:15 AM and 18:00 PM.

It is important to analyze traffic patterns on roads that lead to the airport, as this information is crucial in determining how any future development in the area may contribute to the existing traffic flow.

4.4.10 Agriculture

According to the fifth Rwanda Population and Housing Census (RPHC5), in Rwanda, there are 2.3 million agricultural households, making up 69% of private households. Of these households, 17.7% are agricultural households found in Kicukiro district.

Nationwide, 63% of private households are involved in crop farming, 50% in livestock husbandry, and a small percentage, around 0.5%, in beekeeping (apiculture). Approximately 51% of all households practice horticulture, which encompasses the cultivation of fruits, vegetables, or ornamental plants. In Kicukiro district, 12.1% of private households are engaged in crop farming, 11.1% in livestock husbandry, 18.6% in horticulture, and only 0.1% in beekeeping.

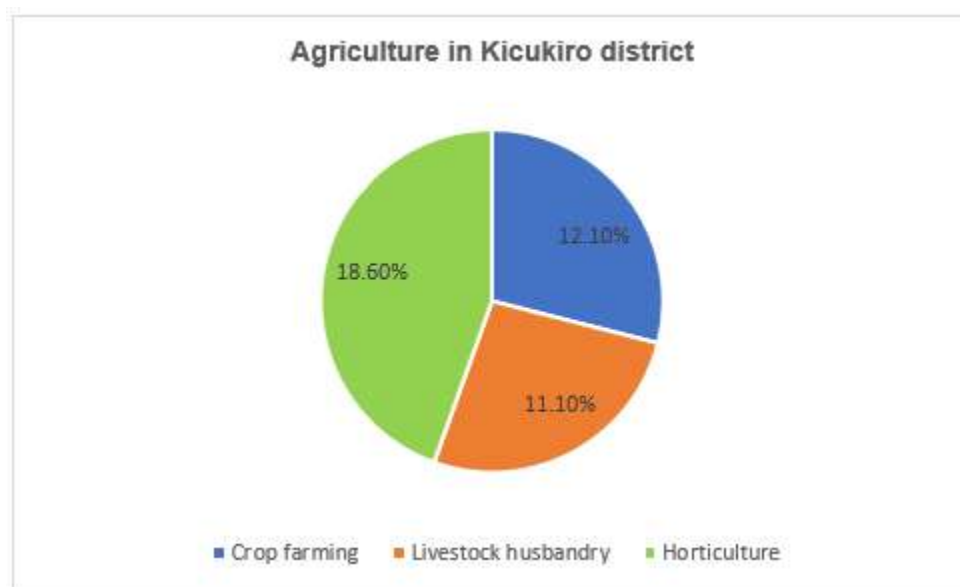


Figure 83: Distribution of households in Kicukiro district by main agricultural practice

Crop farming

In Rwanda, beans are the most commonly cultivated crop, with 80% of households involved in crop farming. Other prevalent crops include maize (56.3%), cassava (48.7%), sweet potato (44.3%), and banana (24.4%). Approximately 50% of households grow at least one variety of fruit. Within the district, the primary crops grown are beans (76%), maize (50.5%), cassava (43%), and sweet potatoes (26%). In terms of vegetables, amaranth is the most frequently grown (8.3%), followed by tomatoes (3.2%), cabbages (2%), carrots (1.2%), onions (1.3%), and eggplants (2.3%).

Livestock keeping

In Rwanda, private households primarily rear cows (28%), followed by goats (19%), pigs (15%), chickens (12%), and rabbits (6%). Only a small number of households (less than 5%) own other types of livestock, such as sheep and beehives. Within the district, rabbits are the most commonly owned/reared livestock (7.3%), followed by cows (3.7%), chickens (4.5%), other types of poultry (0.4%), goats (3%), pigs (1.4%), beehives (1.1%), and sheep (0.6%).

5.0 PROJECT ALTERNATIVES

5.1 Introduction

Alternatives are different approaches to carrying out the project in order to achieve the predetermined goal. They can take many different forms and might vary from small changes to the project to a total reimagining of the project.

This chapter describes the environmental and social justification for the project alternatives that the consultant analyzed, along with the criteria used to determine the significance and an indication of the main reasons that led to the developer selecting the development proposed. This follows the description of the proposed Aircraft hangar and aviation training center project given. Various project alternatives were considered including alternative sites, sourcing of construction materials, waste management, electricity and water supply and No Project Option.

This Aircraft hangar and aviation training center, like any other development project on a specific land, may have impacts that may occur ranging from site clearance to transportation of building materials, construction, and operation works. Therefore, the purpose of this section is to analyze the various development options offered by the developer in terms of their environmental and social impacts, investment and operating cost, compatibility with local conditions, and in relation to institutional and training needs. Hence, identifying alternatives that would result in less adverse impacts.

5.2 Alternative site

The proposed Aircraft Hangar and CoE Aviation Training Center project will be established in Kicukiro district, Nyarugunga sector, with the hangar located in the landside area of the Kigali International Airport, situated 189 meters away from the existing runway centerline. The Aviation academy site will be positioned southeast of the Kigali International Airport's exterior plot within the airport buffer land use. These sites were the only alternative sites considered for the proposed project, as based on the Kigali Master Plan 2020 zoning regulations and the need for such a development to be connected to an existing airport.

According to the Kigali Master Plan 2020, the proposed site for the hangar project is located inside the Kigali international airport and is categorized as T-Transportation zone. Furthermore, a section of the aviation training center project site containing the academic block is within the airport buffer zone, classified as P1-parks and open spaces. This zoning ensures the safety and security of aviation operations around airports. Another portion of the academy training center site where the hostels and recreation facilities will be positioned is classified as the Low-Density Residential Densification Zone (R1A).

The current location for the project is ideal as it is in close proximity to other related structures within the hangar and offices compound, and it blends well with the current use. Looking for alternative land to accommodate a project of this character and the completion of official transactions on it may take a long period. Additionally, it would create a disconnect between the Aircraft services and the proposed facilities, which need to be connected to the airport services and facilities such as the runway.

Furthermore, there is no assurance that land in a desirable location like this would be accessible. It is also important to note that Rwanda is known as "land of a thousand hills," indicating that the terrain is hilly. Consequently, locating a flat, elevated piece of land suitable for constructing an aircraft hangar is challenging. Due to the high population and growing urban infrastructure, finding available land is becoming increasingly scarce.

5.3 Alternatives for waste management

Solid waste management

The management of solid waste within the hangar and aviation training center facilities will be taken care of by the management team. To properly manage the solid and e-waste generated, it would be best to sort them out at the source. Storage bins will be provided in suitable areas within the hangar and academy training facilities, clearly labeled for segregating different types of waste. The central collection refuse rooms will be chilled to reduce odors and flies. The licensed private association/cooperative will transport solid waste directly to the municipal dumpsite (Nduba dump site) for proper management. Private associations or cooperatives will handle organic waste for composting, non-organic waste for reduction and recycling.

The airport waste management team and RAC are dedicated to complying with the regulations for handling hazardous waste, including proper segregation, labeling, and containment. Additionally, they have established contracts and MoU for collecting, disposing, and recycling various types of waste. The airport waste management team will dispose of hazardous waste at a specific hazardous disposal site, while RAC has a contract to collect garbage at KIA and deposit it at a recommended waste receiving site in Kigali. RAC also has an MoU with REMCO for the recycling of steel scraps. The hangar facility will follow KIA's waste management plan, and both the airport waste management team and RAC will responsibly handle waste using appropriate disposal and recycling methods.

Liquid waste management

Typically, septic tanks or mechanical wastewater treatment plants are used to manage liquid waste. However, in an effort to be more sustainable, reduce environmental damage, and improve water usage efficiency, a wastewater treatment plant is being planned.

For a project that can accommodate more than 100 people, REMA suggests a mechanical treatment plant would be more suitable for treating grey water during the project's operation. Therefore, separate wastewater treatment plants will be provided for both the hangar and aviation training center. These plants will be built to process the grey water produced by the project's facilities. Once treated, the water can be used for non-potable purposes such as cleaning, irrigation, and toilet flushing. The wastewater treatment plant for the academy training center facilities will be located at the lower part of the site to take advantage of gravity.

It's important to note that the mechanical wastewater treatment plant could potentially cause more immediate and harmful effects in case of breakdown or spillage, leading to a bigger source of point pollution. However, this can be managed. Therefore, this option is the most appropriate to reduce environmental damage and improve water usage efficiency.

During the period of construction, it is necessary to provide temporary sanitation facilities for workers, and in this case, the alternative considered would be the use of temporary ecosan toilets. These toilets have been designed to have minimal environmental impact, as they conserve water and offer opportunities for composting human waste.

5.4 Alternative for power supply

The proposed project is expected to consume 200 to 300 kilowatt hours (kWh) of electricity during the construction phase for the aircraft hangar, and 400 to 600 kWh for the aviation training center. During the operational phase, the hangar will require 100 to 250 kWh of power, while the academy training center will need 250 to 400 kWh.

Two alternatives for the supply of this quantity of power to the facilities were examined. The first option involves connecting both the hangar and training center to the existing KIA substation. The second option involves connecting only the hangar to KIA's substation, while the training center connects directly to the public electricity supply system from REG. However, it was recommended that the first option was the most cost-effective option. Therefore, both the proposed hangar and aviation training center will be connected to the existing KIA substation.

Both the Aircraft hangar and aviation training center will be connected to backup generators for emergency power supply in case of a power outage. The generator will be located in a soundproof enclosure close to the hangar to reduce noise pollution, and this setup will avoid the need for lengthy distribution cables. To prevent overloading the public distribution line and causing insufficient power voltage in the hangar, a separate transformer will be installed near the hangar to provide a dedicated power supply.

Although using municipal energy sources is not entirely eco-friendly and can contribute to resource extraction and air pollution, the proposed solution to maximize energy use efficiency and minimize resource exploitation is to install solar panels on the roof to supplement the energy requirements within the facilities. However, the proposed option for solar panels will need to undergo a review and evaluation process by both the RCAA and RAC before being approved. Additionally, an aeronautical study will be conducted to assess the impact of solar panels on aviation activities.

The following are the details of the proposed solar panel system:

For the Aircraft hangar:

- Solar Panel System Size: 4kW
- Number of Solar Panels: 96
- Required Roof Space: 168 sq. meters.
- Annual Electricity Output: 20400 kWh

For the CoE aviation training center:

- Solar Panel System Size: 4kW
- Number of Solar Panels: 64
- Required Roof Space: 112 sq. meters.
- Annual Electricity Output: 13,600 kWh

5.5 Alternative for water supply

During the construction stage of the proposed project, it will be essential to draw a daily quantity of water ranging from 10 to 30 cubic meters for constructing the aircraft hangar, and 20 to 40 cubic meters of water for constructing the training center. After the construction phase, during the operation of the project, the hangar operations will necessitate about 8 to 20 cubic meters of water each day, while the academy operations will need around 15 to 25 cubic meters of water on a daily basis.

Two alternatives for the supply of this quantity of water to the facilities were examined. The first option involves connecting both the hangar and training center to the existing KIA water supply network and nearby

WASAC water tank for water needs. The second option involves connecting only the hangar to KIA's water supply network and nearby WASAC water tank, while the training center connects directly to the public water supply system. However, it was recommended that the second option was the most cost-effective option. Therefore, the proposed aircraft hangar will be connected to the existing KIA water supply network and nearby WASAC water tank while the training center connects to the public water supply system.

The water will be pumped to an elevated tank within the Academic block building to ensure suitable water pressure and flow rate. The system has been designed to prevent impurities that could make the water unsafe for consumption.

To supplement the municipal water supply, a rainwater harvesting system will be implemented for both the hangar and academy training center. This system involves collecting rainwater from the roof and directing it into an underground tank via rainwater downpipes. Before being drained into the reservoir, the water will undergo filtration. The system is an eco-friendly approach to reduce soil erosion and promote the use of natural resources. The size of the storage tank will depend on the size and orientation of the roof.

Overall, this alternative offers a sustainable and reliable water supply solution for the project.

5.6 Alternative sources for construction materials

The project seeks to meet environmental goals of limiting carbon release into the atmosphere, thus material sourcing for civil works for the project facilities will be done locally as much as possible near the site and within Rwanda. Building materials that are commonly found locally, such as stones, Ruliba blocks, burnt bricks for walls, straw board for partitioning, and cement produced within Rwanda, will be used to decrease the project's carbon footprint and CO₂ emissions.

The nature and size of the Aircraft hangar and aviation training center facilities' construction will be accommodated by a variety of structural techniques and materials. Building materials must be chosen to enhance and sustain the environment. Materials shall be selected on the following additional basis:

- Materials that are made and available locally, avoiding importation.
- Materials that will contribute to a longevity of at least 50 years lifecycle preferably 100.
- That will be recyclable and reused, and without polluting the environment if disposed of.
- Materials that require minimum industrial processing.
- Materials that exert minimal damage to the environment during fabrication.
- Materials that minimize transportation distances and costs.
- Designers who will consider the full life cycle of the product, from creation to arrival at the site during use, and post-occupancy.
- Design for disassembly to allow building products to be reused should that be necessary or desirable.
- Reduction of the use of cement, benchmarking against other local buildings, and adopting standard construction practices that reduce the use of cement.

5.7 The “No project” Alternative

The Government of Rwanda considers the transportation sector to be a significant driver of economic growth. To attract both domestic and foreign investment in the country, it recognizes the importance of enhancing the quality and dependability of transport services while reducing costs. To this end, the government has implemented a comprehensive investment plan and capacity building program that includes expanding Kigali International Airport and other domestic airports, establishing an aviation training school, providing navigational services, constructing a new international airport, and supporting the growth of the national carrier, RwandAir.

The zero alternative for the purposes of the assessment is the situation where the project does not proceed. Under the zero alternative for the project there are no adverse environmental or social impacts as there is no construction or operation of the Project. However, this would need to be balanced against the fact that there would also be no beneficial impacts associated with the project not being implemented such as to empower labor in aviation industry by providing qualifications in the field to serve local (Rwanda) and regional needs as well as provide shelter for fixed wing, rotary wing, maintenance/engineering and other technical aircraft activities.

This option was not considered viable because:

- This would mean no job creation: At the stage of construction, the prospects of employment of skilled and unskilled labor for masons, draftsmen, drivers, mechanics, engineers would be lost.
- Income to government: Income in the form of taxes to the government from the increased profits will not be realized.
- The area will not open quickly to other investments, which will also be a source of employment for the locals.
- Income source for over 1000 workers during construction and 98 workers during operations, cost efficient local construction material for all types of construction projects, payments made for the energy and water consumed are all sources of income and revenue to the Government that could be lost if this option of doing nothing was taken.

Already a considerable financial commitment has been made for the feasibility and environmental studies, as well as development of architectural plans and related designs. In case the project is not implemented, all the participants such as the designers, the local and national authorities, the contractors, materials suppliers, and the workers in the development chain will lose economic gains that would have otherwise been realized during the project life.

5.8 The Comparison of Alternatives

Under the proposed development alternative, the project will provide short term jobs for 1000 workers during construction and 98 workers during operations. In addition, the project aims to utilize the available space effectively and empower local labor in aviation expertise by offering bachelor's and higher-level degrees in the field. The provision of shelter for fixed-wing, rotary-wing, maintenance/engineering, and other technical aircraft activities further highlights the project's potential benefits. Although there may be negative environmental impacts, these can be minimized through effective implementation of mitigation measures and construction management practices. Overall, the proposed alternative offers significant advantages over other options and is worthy of serious consideration.

6.0 IMPACT IDENTIFICATION

6.1 Introduction

"An impact" can refer to any alteration to the current state of the environment that results from human actions or an external factor. High-level categories of project receptors that may be affected adversely or beneficially can be identified as:

- Environmental (such as air quality, waterbodies, landscapes, terrestrial soils, and geology)
- Biodiversity (such as habitats, species etc.)
- Social (such as residents of local communities, businesses, land and other resource users, and cultural heritage resources).

Impacts therefore may be positive/beneficial or negative/adverse. They may also be direct or indirect, long-term, or short-term, and extensive or local in effect. The identification of the impacts is categorized as

- Primary impact- where the construction and operation works will be concentrated i.e., within the boundaries of the aircraft hangar site and the aviation training center site.
- Secondary impact- the off-site activities such as borrow sites, quarries, and other source of material such as water, sand, murram, excavation, waste disposal, camp site, location for accommodation of personnel, equipment, and storage of materials.

When impacts build upon one another, they are said to be cumulative. The construction and operation of the Aircraft hangar and aviation training center, as well as other auxiliary facilities, could result in positive or negative environmental effects. To assess the potential impacts of the proposed project, the consultant used various techniques and tools to identify both the positive and negative impacts and evaluate their significance. The analysis included examining the severity, intensity, nature, extent, magnitude, and duration of the potential impacts, as well as the sensitivity and vulnerability of the affected environment. By using this approach, the consultant was able to identify the impacts and recommend mitigation measures to address them.

6.2 Project categorization

Each component of the proposed project was screened for environmental safeguards at the project conceptualization stage. There are risks specific to the operation of the project which include noise pollution, and the handling of hazardous materials, occupational health and safety issues, and community health and safety issues, to mention a few. Construction works of the proposed project and auxiliary facilities posing environmental risks involve major civil works which will result in temporary and highly localized adverse impacts and occupational safety concerns.

Such works have the potential for adverse temporary and site-specific environmental impacts. As a result, the overall proposed Aircraft hangar and aviation training center project was classified as a project likely to cause less adverse environmental and social impacts, category 2 per AfDB OS1, as well as IL2 per national EIA guidelines.

6.3 Methodology of evaluating impacts

6.3.1 Criteria for evaluating the significance of impacts.

The impact may be positive or negative. A positive impact generates an improvement of the component of the environment affected by the project, while a negative impact contributes to its deterioration. Impact is evaluated based on the criteria defined below.

6.3.1.1 Duration of an impact

Impact can be described as temporary or permanent. A temporary impact may be spread over several days, weeks or months, but must be associated with the notion of reversibility. While a permanent impact has a character of irreversibility is observed permanently or long term. The evaluation of the frequency or recurrence of the anticipated impact also contributes to better defining the notion of duration.

6.3.1.2 Extent of the impact

The extent of the impact of action refers to the environmental or spatial extent of its impact. It may be specific, local, or regional. To some extent, it is independent of the limitations of the study areas that have been identified for this project.

A regional scope relates generally to a vast territory with a geographical structure and / or administrative which is defined and perceived by a population, or who may be from natural components of the environment found there (e.g., Ecological district which includes large similar physiographic features).

Local scope refers, in turn, to a portion of smaller territory, a particular ecosystem at a given administrative entity or an environmental dimension that is perceptible as part of a regional population.

6.3.1.3 Intensity of impact

The intensity of the impact depends on the extent of the changes observed on the component affected by a project activity or disturbances that result. Thus, a low intensity is associated with an impact causing only slight modifications to the target component; do not question its use or features.

Finally, an impact is qualified high intensity when bound to very significant changes in a component. For the biological environment, high intensity is the destruction or alteration of an entire population or a high proportion of the size of a population or habitat of a species. About the human environment, negative intensity is considered strong if the disturbance affects or limits irreversibly the use of a component by a community or population, or whether its functional and safe use is severely compromised.

6.3.2 Assessment of the significance of the impact

The outcome of an overall assessment, which concentrates on the impact of a project activity compared to a component of the receiving environment and is based on the criteria outlined above, is the significance of an impact. Four major classes are used for this purpose: negligible, minor, moderate, or major. Significance is determined by a construction which combines the criteria described in 6.3.1, this is to say the value of the affected part, the duration of the impact, the extent and intensity of the disturbance that it generates on the environment, all put into perspective by one or specialist (s) in the field. The table below shows the grid for determining the overall significance of an impact.

Table 9: Project impacts assessment

Intensity	Extent	Duration	Significance of impact		
			Major	Medium	Minor
Strong	Regional	Permanent	×		
		Temporary		×	

Intensity	Extent	Duration	Significance of impact		
	Local	Permanent	×		
		Temporary		×	
	Punctual	Permanent		×	
		Temporary			
Medium	Regional	Permanent	×		
		Temporary		×	
	Local	Permanent		×	
		Temporary			×
	Punctual	Permanent		×	
		Temporary			×
Weak	Regional	Permanent		×	
		Temporary			×
	Local	Permanent		×	
		Temporary			×
	Punctual	Permanent			×
		Temporary			×

Risk assessment is used to relate the impact assessment using a stipulated assessment criterion whereby impacts are identified and given a rating or weighting and obtaining an overall rating or significance of an impact) and risk management (relating directly to applicable mitigation measures to be implemented to manage a risk of an impact in the best interest of a society; Schogren, 1990). The guideline criteria followed in this study are presented in the table below.

Table 10: Impact Significance with criteria assessment and ratings

Nature or Status of the Impact: The type of effect the activity would have on the environment	
Status	Description
Positive:	a benefit to the holistic environment
Negative:	a cost to the holistic environment
Neutral:	no cost or benefit
Duration of the Impact: The lifetime of the impact	

Nature or Status of the Impact: The type of effect the activity would have on the environment		
Score	Duration	Description
1	Short term	Less than 2 years
2	Short to medium term	2 – 5 years
3	Medium term	6 – 25 years
4	Long term	26 – 45 years
5	Permanent	46 years or more
Extent or Scale of the Impact: The distance from source that impacts may be experienced		
Score	Extent	Description
1	Site specific	Within the site boundary
2	Local	Affects immediate surrounding areas
3	Regional	Extends substantially beyond the site boundary
4	National	Affects country
Reversibility of the Impact: To what degree its influence on the relevant environment can be negated		
Score	Reversibility	Description
1	Completely reversible	Reverses with minimal rehabilitation & negligible residual affects
2	Reversible	Requires mitigation and rehabilitation to ensure reversibility
3	Irreversible	Cannot be rehabilitated completely/rehabilitation not viable
Intensity or Magnitude of the Impact: Severity of the negative and magnitude of positive impacts		
Score	Severe/beneficial effect	Description
1	Low	Little effect - negligible disturbance/benefit
2	Low to moderate	Effects observable - environmental impacts reversible with time
3	Moderate	Effects observable - impacts reversible with rehabilitation
4	Moderate to high	Extensive effects - irreversible alteration to the environment

Nature or Status of the Impact: The type of effect the activity would have on the environment		
5	High	Extensive permanent effects with irreversible alteration
Score	Severe/beneficial effect	Description
Probability of the Impact: Describes the likelihood of the impact actually occurring		
Score	Rating	Description
1	Unlikely	Less than 15% sure of an impact occurring
2	Possible	Between 15% and 40% sure of an impact occurring
3	Probable	Between 40% and 60% sure that the impact will occur
4	Highly Probable	Between 60% and 85% sure that the impact will occur
5	Definite	Over 85% sure that the impact will occur
The Consequence (C)		= Magnitude/Intensity (M/I) + Extent (E) + Duration (D) + Reversibility (R).
Determination of Significance After assessment of an impact in accordance to the criteria described above, the significance of an impact can be determined. The various ratings as indicated above are according to these criteria. These ratings are then used to calculate a significance (S) rating and are formulated by adding the sum of ratings given to the extent (E), duration (D), Reversibility (R) and intensity (I) and then multiplying the sum with the probability (P) of an impact as follows: Significance (S) = (E+D+R+I) X P		
Significance rating		
Score out of 100		Significance
1-14		Very low
15-29		Low
30-44		Medium-low
45-59		Medium-high
60-80		High
81-100		Very high

Table 11: Significance of impact criteria

Magnitude of potential impact	Sensitivity of receptors			
	Very severe	Severe	Mild	Low/ negligible
Major	Critical	High	Moderate	Negligible
Medium	High	High	Moderate	Negligible
Minor	Moderate	Moderate	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

6.4 Potential Impacts

6.4.1 Positive Impacts

The positive impacts of this project refer to the benefits the Aviation Hangar and Academy Training Center project will bring to the area and the nation as a whole. Enhancement measures are elaborated on as well in the following section.

6.4.1.1 Creation of job opportunities

According to EICV5, Kicukiro district has an overall working to population ratio of 71.9%. This suggests that the project being proposed has the potential to increase the working to population ratio by generating employment opportunities in the project area. This includes direct and indirect job opportunities for a significant number of the population during the construction, operation, and decommissioning phases thus, reducing unemployment and, in the process, providing livelihood.

The estimated number of construction workers needed during the 24-month construction phase is up to 1000 individuals. The labor force will comprise of unskilled workers such as foremen, trucks drivers and others from local communities who will perform general work, as well as skilled laborers who are either locally sourced or imported from foreign countries.

Direct job opportunities are available for high-calibre professionals including architects, engineers, civil works contractors, and consultants during the construction phase, while during the operation phase there will be pilots, aircraft maintenance staff, cabin crew and others who are locally born hence job opportunities for skilled labour on the Rwandan job market. It is estimated that up to 98 personnel will be hired during operations of the facilities, these including skilled labour and unskilled labours. At the current design stage of the project, the proposed project has already provided employment and provision of jobs for public and private workers. Such activities are to increase the production value and contribute to the Rwandan economic development and national income.

Enhancement measures

- The developer will ensure compliance with the Law N° 66/2018 of 30/08/2018 regulating labor in Rwanda.
- During the employment of semi-skilled and unskilled labor, priority should be given to the residents and immediate community.
- The contractor should inform workers (mostly during construction) that the employment opportunity is short-term to prepare them in case employment comes to an end due to the reduction of work.
- All workers (including subcontractors) will be trained on health and safety, and Emergency Preparedness and Response Plan to respond timely to the incidents.
- The developer should offer training and development programs for local residents for services that they may require in the implementation and operation phase.

6.4.1.2 Flow of income-or wealth-enhancing activities

The acquisition of raw materials and necessary fittings and components as well as employment for this project will have an impact on economic flows within the area and the country. The trading of goods and services will contribute to income generation and development. The proposed project will support the business market in Rwanda as a whole. During the construction phase of the project, there will be the acquisition of various raw materials such as sand, stones, Ruliba blocks, burnt bricks for walls, straw board for partitioning, cement, timber, paint, metal strips, reinforcement bars, nails, roofing materials, door frames, doors, hinges, and ceramics as well as fittings such as pipes, sinks, shower installments, WCs, etc. With most of these items to be sourced locally.

As was already mentioned, during the operation phase, the facility will employ a variety of people who will use their income to access goods and services. The facility will also require a variety of services, which will result in money flowing among various users and support wealth-enhancing activities for the Rwandan population.

Enhancement measures

- The goods and materials shall be sourced locally as much as possible to enhance the income of the residents in the project area.
- Construction contracts should stipulate that the contractor sources materials from approved sites and sources in the locality where possible.
- Products required in the operation phases such as food items and more, will be sourced locally as much as possible.

6.4.1.3 Economic development and revenue collection

Rwanda has recognized air transport as a crucial element in its economic development, and a means of positioning itself as a regional service, tourism, and conference hub. The proposed Aircraft hangar and aviation training center project, with an investment cost of 53.5 million USD, is expected to increase economic activity in the district and create opportunities for direct and indirect employment.

Akagera Aviation Ltd anticipates boosting government revenues through taxes on employee income and various licenses, including construction permits. The proposed project will also stimulate the local economy by generating demand for essential services such as shopping centers and pharmacies.

These activities will not only benefit the area's residents but also increase revenue collection, enabling the district to meet its development targets as outlined in the IMIHIGO. Additionally, the contractor's statutory contributions to employee welfare and sales tax on construction materials will contribute to government coffers.

Enhancement measures

- The goods and materials shall be sourced locally as much as possible to enhance the income of the residents in the project area.
- Construction contracts should stipulate that the contractor sources materials from approved sites and sources in the locality where possible.
- Products required in the operation phases such as food items and more, will be sourced locally as much as possible.
- Akagera aviation Ltd should establish partnership with airlines such as RwandAir and other businesses where such partnerships with airlines and other businesses can bring in additional revenue through joint marketing campaigns, shared revenue from retail outlets, and other collaborations.
- During the operational phase, financial institutions should be established near the project area to ease accessibility to banking systems and services.

6.4.1.4 Promotion of gender equality

The Integrated Household Living Conditions Survey 5 (EICV 5) in Rwanda has reported that the number of working-age men and women in Kicukiro district is 137 and 136, respectively. This data highlights a slight gender imbalance, with women slightly lagging behind their male counterparts. To promote gender equality in the region and the country as a whole, the contractor responsible for constructing the aircraft hangar and aviation training center must ensure the employment of women for various roles, such as engineers, foremen, and other positions traditionally held by men.

According to the 5th Population and Housing Census conducted in 2022, there is a significant gender disparity in education levels among young people in Rwanda, with a higher proportion of males holding a university-level education compared to females (3.8% vs 2.8%). This indicates a pressing need to address this issue and promote gender equality in education. The establishment of the aviation hangar and academy training center presents an opportunity to bridge this gap by offering higher education and training opportunities for women. This will not only help to increase the number of women in male-dominated careers such as piloting and aircraft maintenance staff, but also create equal employment opportunities for all genders during the operation of the facilities. Consequently, this will help to decrease poverty rates associated with women more than men, as they will have access to better-paying jobs and career advancement opportunities.

Enhancement measures

- During the construction phase, the contractor should prioritize the employment of women and ensure that they have equal opportunities to work alongside their male counterparts in construction activities.
- The aviation hangar and academy training center can conduct outreach programs to schools and communities to promote aviation as a viable career path for women. This can include information sessions, career fairs, and other events aimed at encouraging more women to pursue careers in aviation.
- The project can incorporate gender-sensitive policies in the workplace, including equal pay for equal work, flexible work arrangements, and family-friendly policies such as maternity leave. Such policies will help to create a conducive environment for women to thrive and excel in their careers.
- The project can collaborate with women's organizations to promote gender equality and support women's empowerment initiatives. This can include partnerships with organizations that provide mentorship, leadership training, and advocacy for women's rights and gender equality.
- The developer should undertake research to better understand the barriers that prevent women from entering and advancing in the aviation industry. Therefore, addressing these barriers can lead to a more gender-inclusive aviation industry.
- The developer has considered in the design, separating accommodations for girls and boys to maximize privacy and safety.

6.4.1.5 Support to tourism and local business

The Rwandan government has made considerable investments in the tourism industry, particularly in the leisure and MICE sectors, with tourism contributing an estimated 3.6% to the country's GDP as of 2019. As the tourism sector continues to recover from the COVID-19 pandemic, the aviation industry is expected to play a crucial role in boosting its revenues. Akagera Aviation Ltd is supporting the tourism sector by offering helicopter rides to thrilling destinations such as Bisate Lodge, Volcanoes National Park, Nyungwe Forest National Park, and Akagera National Park.

The establishment of an aircraft hangar and aviation training center by Akagera Aviation Ltd will enhance its operations, enabling the company to provide its customers with even more luxurious and unforgettable experiences through the deployment of better-maintained aircrafts and highly trained crews. This will ultimately increase the number of tourists visiting Rwanda as a result of excellent services.

Moreover, Akagera Aviation Ltd will also contribute to shaping the aviation sector in Rwanda by supplying skilled labor to RwandAir through an established partnership. The airline will benefit from the academy's graduates, who will have undergone rigorous training, enhance its reputation and boost the tourism sector. The tourism industry's growth will be a significant revenue stream for local businesses visited by tourists while in Rwanda.

Enhancement measures

- The developer can promote eco-tourism by offering tours to natural parks and wildlife sanctuaries, which will help in raising awareness about the importance of conservation efforts in the country.
- The developer can continuously train and develop their employees to improve their skills and knowledge in the aviation and tourism industry. This will offer high standard customer care training at all levels in the academy to provide high standard services to all tourists and build a good reputation.
- Continuously improve the customer experience by gathering feedback from customers and implement changes to their services and operations based on the feedback received.
- Akagera aviation Ltd will establish partnerships with local businesses that will offer exclusive package deals and a seamless and convenient travel experience for clients and tourists that may use their aviation services. Such services may include restauration, leisure, and others.

6.4.1.6 Technological change and innovation

Rwanda is taking significant steps towards becoming a leader in high technology and innovation, as evidenced by its launch of a national drone delivery system, which is one of the first in Africa. This is just one example of many technological and innovative advances that are being made in the country.

With the establishment of the aviation hangar and academy training center, technology and innovation will also be incorporated into the construction phase. Advanced green technology materials will be used to reduce emissions and make the facilities greener.

In the operation phase, the training center and hangar will use high standard technology and innovative training methods to maintain and keep the aircraft in safe and well-functioning systems, offering the best possible performance. The academy will also have teaching facilities equipped with high-tech standards, ensuring that those who train there will be on par with their counterparts from other aviation training centers around the world. This will help Rwanda establish itself as a hub for technology and innovation in the aviation industry.

Enhancement measures

- The contractor will use materials that are built with green technology that will emit less greenhouse gases.
- The project will collaborate with regional and international universities such as Coventry University, as well as research institutions to develop new technologies and innovations. This can lead to the creation of new products, processes, and services that can help to improve the efficiency and safety of the aviation sector in Rwanda.
- The project can invest in continuous training and development of its employees to ensure they stay up to date with the latest technologies and innovations in the aviation industry.
- The project will embrace renewable energy sources such as solar to supplement power needs, thus reducing its carbon footprint and promoting the use of sustainable technologies in the aviation sector.
- The project proponent can invest in research and development of new aircraft models that are more fuel-efficient, less noisy, and emit fewer pollutants.
- The developer will partner with international aviation organizations such as the IATA and the ICAO to gain access to the latest technologies and innovations in the aviation industry, thus

ensuring that the project is at the forefront of technological change and innovation in the aviation sector.

6.4.1.7 Stimulation of foreign investment and international trade

The construction phase of the proposed project will create opportunities for branding and marketing the project, which can attract foreign investment and boost international trade by creating awareness of the project and the local aviation industry. The proposed project will be financed by the African Development Bank (AfDB) with an injection of 53.5 million USD, thus promoting regional integration in the aviation industry by creating a larger market for aviation-related products and services.

The operation phase of the aviation training center will produce skilled and certified professionals that can meet the growing demand for pilots, engineers, technicians, and other aviation-related jobs. This can attract foreign investment and boost international trade by creating a skilled labor force that can work in aviation and aerospace companies around the world. The project will help to build a positive reputation for the local aviation industry, which will attract foreign investment and boost international trade by creating a favorable environment for doing business.

Furthermore, the aviation training center will provide a platform for building global partnerships and collaborations between governments, businesses, and academia. This will facilitate the exchange of knowledge, expertise, and best practices in aviation and aerospace.

Enhancement measures

- Akagera aviation Ltd should invest in marketing and promotion so that the facilities attract global partnerships and investments.
- Encouraging PPPs between the government and private companies can help attract foreign investments and improve the efficiency of the facilities.
- Establish partnerships with the government for providing tax incentives to foreign investors to encourage them to invest in the industry.
- Streamlining regulations and procedures related to aviation can reduce the costs and barriers to entry for foreign investors.

6.4.1.8 Improved infrastructure and status of the area

The construction of the aircraft hangar and aviation training center will create opportunities for the development of infrastructures, such as fiber optic networks; roads, wastewater treatment, water, and electricity, which will improve the connectivity and accessibility of the region, as well as the quality of life for the local community and attract more businesses to the area, which will enhance the status of the area.

Furthermore, the design of the aircraft hangar and aviation training center has been optimized to ensure the efficient use of land space in Kigali city. This will lead to increased returns on land investment in the area, making it more economically viable for businesses to invest in the region.

Enhancement Measures

- Maintaining a continued role of all stakeholders to the project in the implementation phase, for combined efforts in sustaining this development.

- Adequate regular maintenance of the infrastructure will be required to sustain the buildings and positively increase the conditions that will be existing then.
- Creating opportunities for enhancing trade such as new business for the locals and catalyzing economic generation in the area.
- The design has considered enhancing the attractiveness of the building such as the visual amenities of the project components.
- The enhancement in accessibility of the facilities by improving road networks, transportation, and parking facilities can make them more attractive to locals and investors.

6.4.1.9 Enhanced maintenance and protection of aircraft

The operation of the aircraft hangar will provide shelter and protection of the aircraft from weather elements that can cause damage to aircraft over time. This will help to preserve the aircraft's external features and internal components, thus reducing the frequency and cost of repairs and maintenance. The hangar's interior will be temperature-controlled and air-conditioned, creating a controlled environment that will help to prevent damage to aircraft from humidity and temperature fluctuations. This will help prevent corrosion and rust, thus prolonging the life of the aircraft and reducing maintenance costs.

The aircraft hangar will be equipped with maintenance facilities, including workshops, storage rooms, equipment, and tools, to perform maintenance and repairs on aircraft. This will allow aircraft to be serviced in a safe and controlled environment, reducing the risk of accidents, and ensuring that repairs are done to the highest standards.

Furthermore, the aircraft hangar will typically be equipped with security features such as access control systems, CCTV cameras, and alarm systems to ensure the safety and security of aircraft. This can help prevent unauthorized access and theft, vandalism, and other forms of damage that can affect aircraft safety and performance.

Enhancement measures

- There shall be regular inspections of aircraft and equipment necessary to identify any potential safety issues and prevent accidents.
- Implementing safety protocols and guidelines, such as maintenance schedules, standard operating procedures, and emergency response plans, can help ensure that all aircraft and facilities are operating safely and efficiently.
- The facilities shall provide training to employees and students at the academy on safety procedures, maintenance practices, and emergency response.
- The proponent should invest in advanced technology that can help identify potential safety hazards and streamline maintenance processes.

6.4.1.10 Capacity building

The construction phase of the aircraft hangar and CoE aviation training center project will require various skills and expertise, including architecture, engineering, construction management, and many other related fields. This phase will provide opportunities for local workers to acquire new skills and expertise, which will improve their employability and contribute to capacity building in the construction industry. In addition, the proposed project construction will require the use of new technologies and equipment. Therefore, the construction team will need to transfer these technologies to local workers or suppliers, which will help build capacity by providing them with new knowledge and equipment.

The operation of the aircraft hangar and aviation training center will provide a platform for knowledge transfer between experienced aviation professionals and new recruits. This can help build capacity by ensuring that new recruits are equipped with the knowledge and skills necessary to succeed in the aviation industry. In addition, the project will provide state-of-the-art facilities and equipment for technical training, which can help enhance the technical expertise of aviation professionals.

The operation of the aviation training center will transfer knowledge through the quality education that will be given in the different departments including piloting, air traffic management, cabin crew, maintenance, aeronautical meteorology, and others. This will support research and development in the aviation industry, thus leading to the development of new technologies and aviation best practices.

Enhancement measures

- There will be customized training programs that are tailored to the needs of specific industries or clients and can help attract more clients and increase revenue.
- There will be modern training equipment, such as simulators and virtual reality systems, that can enhance the training experience and provide trainees with a more realistic and immersive learning environment.
- The project proponent will hire experienced and qualified trainers who have industry experience and relevant certifications that can enhance the quality of training and provide trainees with valuable insights and practical knowledge.
- The proponent should regularly hold trainings that will help the recruited workers acquire these crucial skills and information.
- Locals will be given preference when hiring, and as a result, they will engage with specialists from other sectors and disciplines, thus increasing their expertise.
- Construction will expose local artisans to expatriates in both construction and supervision and thus accord them opportunities to acquire new skills, technologies, and approach to doing things all of which amount to enhancing the local technical capacity.
- The developer can make it a contractual obligation for the contractors to hire and train a specific percentage of women.
- Capacity building should be held to improve on the proponent's awareness on environment protection and sustainability.

6.4.1.11 Improved reputation of the aviation sector

The construction of the aircraft hangar and CoE aviation training center project will have a positive impact on the aviation industry in Rwanda. The aviation training center will provide educational and training programs to aspiring aviation professionals, including pilots, aircraft maintenance, and air traffic management. This will help to enhance the skills and knowledge of the workforce in the aviation industry, thus promoting it as a knowledge-based, innovative, and growing sector. Additionally, the provision of training and development programs will help to improve the skillsets of aviation professionals, which, in turn, will improve the overall quality of the industry.

The aircraft hangar will also play a significant role in improving the quality of services provided by industry. The hangar will offer maintenance and repair services to the aircraft, ensuring that they are in top condition. This will not only ensure that the aircraft are safe to use but will also improve the reputation of industry. Furthermore, the project will help to improve the safety of the aviation industry by providing comprehensive training programs that focus on safety protocols and best practices. By improving the skillsets and knowledge of the aviation workforce, the industry will become safer and more efficient.

Enhancement measures

- The aviation hangar and academy training center should adhere to international standards and regulations for aviation safety and quality.
- The aviation hangar and academy training center are to establish partnerships with reputable aviation organizations, such as IATA and FAA, to enhance the center's reputation and credibility.
- The developer shall invest in modern technologies and infrastructure, such as state-of-the-art simulators and aircraft maintenance equipment, that can enhance the reputation of the aviation sector and provide trainees with high-quality and innovative training.
- There should be provision of excellent customer service to trainees and clients so that it can enhance the reputation of the aviation sector and attract more trainees and clients who value the center's professionalism and commitment to their success.

6.4.1.12 Increased availability of skilled labor

During the construction phase of the aircraft hangar and CoE aviation training center project, workers who may not have all the necessary skills will receive on-the-job training from skilled laborers, including engineers who can train manpower. This approach will enable the workers to learn the necessary skills while contributing to the project under the guidance of experienced laborers. Additionally, the project proponent will work with local training institutions to offer training programs to students who are interested in pursuing careers in the construction industry. This collaboration will increase the availability of skilled labor in the long term by attracting new talent to the industry.

The CoE aviation training center will provide comprehensive training programs that cover various aspects of aviation, such as aircraft maintenance, repair, piloting, air traffic management, cabin crew, and other operations. The academy will produce skilled workers who can handle a wide range of aviation tasks. To ensure practical skills and experience, the training center will offer hands-on training by providing students with access to real aircraft, engines, and equipment. This approach will equip the trainees with practical skills and make them more valuable to potential employers. The academy will help to increase the availability of skilled labor in the aviation industry, which is growing rapidly and has a high demand for skilled labor.

Enhancement measures

- The facilities will offer a wide range of training programs to provide trainees with diverse skill sets and knowledge. This can help produce a pool of skilled labor that can meet the needs of the aviation industry.
- There will be provision of practical and hands-on training that can help trainees develop practical skills and experience that are essential for the aviation industry. This can also enhance the employability of trainees and increase the availability of skilled labor in the industry.
- The project proponent will collaborate with the aviation industry to help the training center understand the needs and requirements of the industry and develop training programs that are tailored to those needs. This can also help the center establish partnerships with aviation companies and organizations, which can increase the employability of trainees.
- The engineers on site will transfer skills to the foremen who will then acquire necessary skills in the construction sector.

6.4.2 Negative Impacts

Construction phase

Bio-Physical environment

6.4.2.1 Biodiversity loss

As mentioned in the baseline, the proposed location for the aircraft hangar is mostly covered by natural vegetation, which is mainly grass growing on a flat landscape. On the other hand, the vegetation found at the aviation training center site consists of grass mostly *Digitaria Abyssinia* and *Melinis repens*, as well as tall standing trees such as *Mangifera indica*, *Grevillea robusta*, *Lantana camara*, *Clerodendrum johnstonii*, *Jacaranda mimosifolia*.

During construction, site clearance is likely to cause the loss of some plant species across the project area. Due to some planned activities of setting out the construction for buildings (i.e., Academic block, Hostels, Staff quarter, changing and gym, Recreational facilities (swimming, volleyball, basketball), Electrical substations, pump station, WWTP and other MEP facilities, etc.), hangar (Aircraft Hangar and complex offices) some trees will be removed from the site. This will reduce available trees and dependent bird species. However, it is expected that this will not have a significant impact since almost all the vegetation is planted and can be found in other places in abundance.

In the case of removal of tree species, this would cause loss of habitat for some birds. However, the number of trees at the site is already low, and their removal would not cause a significant impact. This process of vegetation clearing is associated with soil erosion and increased run off. The loss of vegetation also has a great effect on the general and localized environment and normally can modify microclimate.

The effects of this may be evident in the decline in rainfall levels, increase in temperature and an increase in humidity. The significance of these changes may not be noticeable in the short-term but may become more evident over time as more vegetation in the area is cleared for the remaining activities in the development plan as well as for the other development activities that have been slated for the area.

Furthermore, within the larger project area of indirect influence, there wetland present including the Rubilizi, and the Mwanana-mulindi-kanombe wetlands, which serve as a natural water purification system and plays a vital role in preventing flooding in the surrounding areas and providing natural habitats for several bird species. Although these wetlands are not directly affected by the proposed project sites given that they fall within the area of indirect influence, it is essential to conduct project activities in a manner that prevents any contamination from reaching the current stormwater drainage systems or underground water channels, which could harm these ecosystems.

Mitigation measures

- Minimize the removal of vegetative cover, felling the least number of trees as possible.
- Design the buildings and plan around existing trees with minimum vegetation removal.
- Adopt conservation measures (e.g., providing appropriate habitats) to enhance the environment for native species, and work with initiatives that encourage biodiversity.
- Undertake compensatory planting using native species from the area and based on Rwandan law. These species should be matched to the site conditions in the area and have a high potential to enhance ecosystem services.
- Indigenous tree species found on site and not earmarked for rescue should be introduced in the parts of the site that are planned for softscape establishments (gardens, around buildings, etc). Care should be taken, however, for potential invasive species.

- Maintaining vegetation planted for landscaping and for aesthetic appeal.
- Plants and trees will be specified that are native to the local climate, to minimize need for extra irrigation and management.
- Protected species will be identified and replanted if deemed necessary to be cleared for land preparation and construction activities.
- Clear vegetation in phases so that only those areas required for immediate development are cleared.
- Grass vegetation cover should be maintained as much as possible, mainly on the steep areas in the northern parts of the site, to avoid soil erosion.
- Proper waste and stormwater management should be carried out to ensure construction activities are not polluting ground water or entering the stormwater drainage system.

6.4.2.2 Soil erosion and compaction

Soil compaction can occur during the construction phase when heavy equipment like bulldozers, backhoes, and excavators are used to excavate and level the land. The weight of these machines can put considerable pressure on the soil, leading to reduced pore space and air space. This, in turn, can decrease water infiltration and make the soil more prone to erosion. The process of grading and excavating the land can disrupt the natural drainage patterns and soil structure, and as a result, rainwater may run off the disturbed soil surface, carrying away soil particles and causing erosion.

In some cases, the construction process may involve the removal of topsoil from the site. Topsoil is the nutrient-rich layer of soil that supports plant growth, and its removal can result in soil compaction and erosion. Without topsoil, the soil becomes more vulnerable to erosion, and the lack of vegetation can exacerbate the problem.

The topography of the proposed site for the aviation training center poses a significant challenge to the project. If proper measures are not put in place to control soil erosion, the impact of this challenge will be amplified. Inadequate implementation or maintenance of soil erosion control measures can lead to soil compaction and erosion, which can be caused by the obstruction of water flow and sediment accumulation on the site. Therefore, it is essential to ensure that the recommended soil erosion control measures are implemented correctly and adequately maintained to prevent any adverse effects on the site.

Mitigation measures

- Installing and maintaining erosion control measures such as silt fences, sediment basins and erosion blankets can help to minimize the amount of sediment that leaves the construction site. Proper installation and maintenance of these measures are crucial for their effectiveness.
- It is advisable to limit the amount of land that is disturbed and minimize the duration and intensity of soil disturbance. This can be achieved by utilizing lighter equipment, reducing the number of passes made on the soil, and avoiding working in wet soil conditions.
- Regularly monitor erosion control measures to ensure they are working effectively and to identify and address any issues before they become more significant problems.
- If topsoil has been removed during the construction process, it should be stockpiled and replaced after construction is complete. This can help restore the soil's fertility and prevent erosion.
- Maintain vegetation cover during and after construction to help prevent erosion. Vegetation can help anchor soil, stabilize slopes, and improve water infiltration.
- Use of appropriate soil management practices, such as adding organic matter to improve soil structure, to help prevent soil compaction.
- Stabilize slopes with appropriate retaining walls or other structures to prevent mudflows or landslides.
- All soil and subsoil stored onsite will be mounded to reduce wind erosion or lightly seeded to aid stability thus preventing dust from arising.

6.4.2.3 Increased runoff and stormwater management

The development of an aircraft hangar and aviation training center can significantly impact the surrounding environment, especially in terms of runoff and stormwater management. The plot where the hangar will be built is currently covered by natural vegetation, during the construction it is expected to be removed which will increase the amount of runoff during rainfall events. Additionally, the use of machinery for the construction will disturb the topsoil, affecting its composition and reducing its water-holding capacity and infiltration potential, thus leading to further runoff of surface water. Furthermore, the presence of already-built paved surfaces around the site, such as for the airport infrastructures, has resulted in soil compaction, increasing the impact of additional compaction for future buildings. The water that flows over these impermeable surfaces generates stormwater runoff that is a significant source of pollution in urban and suburban areas, carrying pollutants such as trash, chemicals, oils, and sediment that harm nearby rivers, streams, lakes, and soils.

Moreover, the steep slope of the site where the aviation training center is to be constructed, along with a road that runs down the site, pose additional challenges for runoff and stormwater management. Runoff from the slopes in the different areas of the site can have catastrophic consequences such as landslides and the formation of large gullies that can swallow parts of the landscape and nearby structures. Even though there is no waterbody within the immediate vicinity of the site, the polluted runoff can be picked up by drainage ditches that could further end up in faraway surface waters thus disrupting aquatic organisms, as well as percolating to the groundwater regimes.

Improper stormwater management during the operational phase of the proposed project will lead to an increase in surface flow, which will result in soil erosion around drainage structures and roads. This erosion will weaken the infrastructure, making it less effective in managing stormwater and potentially leading to further damage. The presence of pollutants in the runoff can exacerbate the damage and contamination of nearby waterways.

Mitigation measures

- Ensure that the soil and subsoil are stored separately to allow for potential reuse onsite or offsite.
- Silt fencing to be installed at the base of mounds to capture and retain any solids mobilized during rainfall events.
- Installation of retention ponds and sediment traps.
- Regular maintenance and inspection of the stormwater management features to ensure that they are functioning properly and effectively managing runoff.
- Adhering to proper stormwater management practices during the operational phase of the proposed project.
- Ensure the use of appropriate drainage system and storm water management system such as use of NBS through grasses & trees planting and the use of paving that can let the penetration of storm water in the ground.
- Provide inspection chambers to allow for inspection and smooth flow of water into public sewers.
- The project should ensure rainwater is harvested from all buildings and store water for gardening and cleaning purposes.
- Ensure harvesting the rain from all buildings and provide appropriate gutters that channel the water into downspouts to the underground tank.
- Control of storm water movement through adequate and correctly constructed storm drains.
- Stabilize slopes with appropriate retaining walls or other structures to prevent mudflows or landslides.

Socio-economic environment**6.4.2.4 Occupational health and safety**

The Occupational Safety and Health (OSH) primarily concentrates on preventing potential risks and covers all aspects of health and safety in the workplace. Its main goal is to avoid any accident or injuries caused by work-related tasks. As the Aircraft hangar and CoE aviation training center project aims to generate job opportunities, the workers should be cautious of potential workplace hazards.

During the construction phase, workers may be exposed to physical hazards such as falling from heights, being struck by falling objects, or being caught in machinery. Workers could also be exposed to chemical and biological hazards, due to exposure to chemicals such as paints, solvents, and adhesives that can cause respiratory issues, skin irritation, contaminants, or even long-term health effects. Additionally, loud noise levels generated during construction could cause hearing damage or other health issues for workers. The job's physical demands, such as lifting heavy materials or staying in uncomfortable positions for extended periods, can expose workers to ergonomic hazards. There is also a possibility of electrical hazards due to the usage of electrical equipment and wiring.

Prioritizing occupational health and safety during construction activities is crucial to prevent injuries and ensure a secure work environment for all workers.

Mitigation measures

- Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment; (c) OH&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents.
- Ensure that a qualified first aider is always present. Equipped first-aid stations shall be easily accessible throughout the site.
- Provide medical insurance coverage for workers.
- Secure all installations from unauthorized intrusion and accident risks.
- Provide supplies of potable drinking water.
- Provide clean eating areas where workers are not exposed to hazardous or noxious substances.
- Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring fellow workers.
- Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitors do not enter hazard areas unescorted.
- Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas.
- Ensure moving equipment is outfitted with audible back-up alarms.
- Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal.
- Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.
- Provide fall protection systems such as guardrails, safety nets, and personal protective equipment to minimize the risk of falls.
- Implement ergonomic controls such as proper workstations, equipment, and tools to minimize the risk of injury.
- Site offices and stores should be constructed closer to the entrance to prevent site visitors from passing through the work areas.
- Provide scaffolding to cater for construction work at high levels. The high-level working areas should be blocked to ensure no materials falls to the lower grounds at all times.

6.4.2.5 Employment-labor issues

According to EICV5, nearly 28.1% of the working population in Kicukiro district are unemployed, therefore residents in the community, especially young people, stand to typically benefit from increased prospects for temporary employment, mainly while the proposed project is under construction and later during operations. Even though locals will be given preference when hiring, there may be situations when local labor is not accessible owing to the need for experience and required skills.

The contractor therefore usually brings labor force from outside, who are skilled and sometimes fulltime employees, which could result in potential social conflict between the contractor and the residents if local skilled and unskilled labor is not hired for the construction period. In addition, the loss of jobs at the end of the construction phase will have an effect on many households in terms of livelihoods and incomes. Their standard of living is likely to fall as they return to previous livelihood patterns.

Mitigation measures

- The contractor should hire at maximum unskilled labor and as much skilled labor from the local community, to ensure priority in relation to employment.
- Ensure that all contracts for employees have clauses that are in line with national labor laws and standards, and that the provisions of the law are adopted accordingly.
- Facilitate workers to form a committee through which their grievances will be received attended to or channeled to management.
- Ensure that workers are aware that their contract is temporary with a specified end date.
- The developer should engage with the local community to understand their concerns and expectations regarding employment opportunities, and work to address any issues or concerns that arise. This can help to build trust and goodwill with the local community and reduce the potential for social conflicts and tensions.
- The proponent is advised to carry out a number of trainings to those who will be employed, on how to start up and operate small scale-business activities from the earnings they will be making.
- Every worker should also sign a code of conduct (CoC) as an annex to the employment contract covering issues such as zero tolerance of unacceptable conduct in the community, GBV, sexual harassment, sexual exploitation, and abuse of children, etc.

6.4.2.6 Impacts of worker-community interactions

There may be an inflow of migrant workers to the neighborhood if outsourcing labor from outside the community is required for the proposed project's construction. This influx may lead to social issues such as increased crime, drug use, and other forms of criminal activity. This can make the residents feel unsafe and uneasy. Additionally, the arrival of workers from different backgrounds may cause cultural clashes and conflicts that could harm the community's cultural identity. The influx of workers can also disrupt the social fabric of the community. Overall, an increase in the number of construction workers might have pervasive consequences on the community. It's therefore critical to respect regional customs and traditions and to encourage cultural interaction.

Mitigation measures

- Engage with the local community early in the project planning process to identify potential issues and concerns related to worker interactions. This can be done through public meetings, focus groups, and other forms of outreach.
- Establish clear communication channels with the local community to keep them informed of project updates, timelines, and any changes that may affect them.
- Provide workers with training in cultural sensitivity to help them understand and respect the local community's customs and values.
- Hire local workers as much as possible to create job opportunities and build stronger relationships with the community.
- Develop and enforce a code of conduct for workers that outlines expected behavior and interactions with the local community, as well as establish a mechanism for resolving conflicts between workers and the local community.
- Implement safety measures, such as traffic controls, to minimize disruption to the community during construction activities.
- Carry out screening of the hired labor force prior to project works.

6.4.2.7 Impact on heritage

Since no such items of historical and cultural treasure were discovered in the project area, there is no impact on historical and archeological treasures. During the site screening and confirmation process, all potential locations with suspected physical cultural values, human remains, or cemeteries were avoided. However, there are potential sites of cultural significance such as a cemetery located near the project area. Although measures will be taken to prevent encroaching on the cemetery area, there is a possibility that the proposed project activities could hinder access to the site and create disruptions due to the movement of heavy vehicles transporting materials to the project site.

If any cultural site is discovered during excavations, construction activities pose the risk of damage such as damage to the remains of the people killed in the 1994 Genocide against the Tutsi if due caution is not taken. The loss of cultural resources would have a profoundly damaging and long-lasting effect. If historical or cultural relics are discovered while the aviation hangar and academy training center is being constructed, it is necessary to work with regional, local, and specialized organizations to take the necessary preservation and conservation measures.

Mitigation measures

- If any archaeological artefact or any things in relation to 1994 Genocide against Tutsi is found, the chance find procedure shall be implemented immediately.
- Any damages to physical-cultural resources must be repaired and restored to pre-project condition by the implementer.
- The contractor will ensure that measures for minimizing traffic congestion are adhered to during construction, to minimize disturbances to the cemetery.
- Avoid encroaching the cemetery while carrying out project activities.

6.4.2.8 Child Labor and Abuse

According to the baseline study of the proposed project, Kicukiro district hosts numerous schools that cater to the educational needs of the local community. These schools include Trinity Nursery School/Gardienne, Students Parents Association, Rwiza Primary School, Rwimbogo Primary School, Kigali Christian Academy, Agape Primary School, Authentic International Academy Kigali, Royal Kids International School, King David Academy, and others. Some of these schools are in proximity to the Kigali International Airport.

Given that the proposed aircraft hangar and aviation training center project will be surrounded by different educational institutions hosting many children that are of a young age, there is potential for the contractor to employ children who have not reached the employment age, therefore violating the child labor laws of the borrower. The child labor laws of the borrower set out that a child under the age of 18 will not be employed or engaged in connection with the project in a manner that is likely to be hazardous or interfere with the child's education or be harmful to the child's health or physical, mental, spiritual, moral, or social development.

The laws of Rwanda also prohibit contractors from employing children in a manner that is economically exploitative, hazardous, detrimental to the child's education, or harmful to the child's health or physical, mental, spiritual, moral, or social development.

Mitigation measures

- The laws regarding child labor should be strictly enforced, and violators should be punished to deter others from engaging in such practices.
- Raising awareness among contractors, subcontractors, and workers about the dangers of child labor and the importance of adhering to ethical standards can help prevent its occurrence.
- Regular monitoring and inspection of the construction site by government agencies, civil society organizations, and independent auditors can help identify any instances of child labor and take appropriate action.
- Working with local communities to develop and implement child labor prevention programs can help address the root causes of child labor and create a sustainable solution.
- Contractors and subcontractors involved in the construction should be required to adhere to strict ethical standards and codes of conduct that prohibit child labor and promote fair labor practices.
- The contractor should ensure that the hired workforce during the construction period is screened and of eligible age to work, in accordance with national labor laws.
- Partnerships should be established with relevant government agencies and NGOs to ensure children access survivor-centered services such as medical care, psychosocial support, legal redress, safety, etc., as, and when necessary.
- Ensure that any sexual exploitation and abuse (SEA) of children by the contractors' workers is promptly reported to the police. Put in place confidential mechanisms for reporting child abuse cases.

6.4.2.9 Damage to the utilities in the area

The presence of the airport and residential settlements in the proposed project area means that there are already existing utilities infrastructures that may be vulnerable to damage caused by the construction activities of the project.

The construction of the aircraft hangar and aviation training center will involve excavation and heavy trucks that can damage underground utilities such as water mains, plumbing networks, meteorological stations, optical fibers, and electrical cables. This can cause disruptions to utility services and can be dangerous for workers on the site. The construction site may also generate dust and debris that can enter nearby utilities and cause blockages or damage to the system.

These disturbances to the utility system within the Nyarugunga sector will most likely affect the livelihood of the people as well as ongoing economic and social activities around the project area involving scarcity of water, and power cutoff. Damage to existing utility facilities within the project site can pose serious injury or death to workers and bystanders that can result from striking underground electricity cables. Damages caused will also be expensive, the utility will have to be repaired, productivity will be reduced, reputations will be weakened, and compensation paid if not well mitigated.

Mitigation measures

- Conduct a thorough survey of the area to identify the location of underground utilities. This will help to avoid accidentally damaging these utilities during construction.
- Notify the relevant utility companies about the construction project and coordinate with them to identify any areas of concern. They can provide guidance on how to work around their infrastructure and may also provide assistance during construction.
- Use protective measures such as shoring, fencing, and barriers to protect utilities from excavation and other construction activities. Use vibration monitoring equipment to ensure that nearby utilities are not being damaged by the operation of heavy machinery.
- Clean up of the construction site properly at the end of each workday. This will help to minimize the amount of dust and debris that could enter nearby utilities and cause blockages or damage.
- Use detection tools before excavating the area and scanning and marked-up the site by trained people using reliable location tools.

Both Construction and Operation phases**Bio physical environment****6.4.2.10 Bird strike hazards**

The construction of the Aircraft hangar and CoE aviation training center project will lead to the impact of bird strikes which can be particularly significant. Bird strikes can occur during all phases of flight, including takeoff, landing, and cruising. During the construction phase, bird strikes can be a problem for workers on the ground, as well as for aircraft flying in and out of the airport. The construction site may attract birds due to improper disposal of the waste. The presence of birds can lead to collisions with aircraft, which can cause damage to engines, windshields, and other parts of the plane. This can be particularly dangerous during take-off and landing, when the plane is flying at a low altitude and may not have sufficient time to recover from the impact.

The operation of the training center poses a potential risk of bird strikes as inexperienced pilots undergo practical training, making them more vulnerable to such hazards. Bird species found at KIA and within a 13km radius include:

- Black kite makes up 76% of bird strikes that occurred at KIA.
- Black-headed heron makes up 13% of bird strikes that occurred at KIA.
- House martins makes up 4% of bird strikes that occurred at KIA.
- Owl makes up 3 % of bird strikes that occurred at KIA.
- Ibis, Yellow billed stork, Plover, Common kestrel, African mash harrier, and Pigeon makes up 4% of bird strikes.
- Other bird species present at KIA include the Long-crested eagle, Grey Crowned –crane, marabou stork, Hooded vulture, African Hawk-eagle, Pied crow, Hamerkop, Swallow, Bishop.

Currently at the Kigali international airport, bird strikes have resulted from:

- Bird crossing or entering the runway during takeoff and landing of the aircraft.
- The airfield grassland habitat interspersed with termite mounds.
- The presence of earthworms, millipedes, and snails moving from the runway strip into the runway during the night or after rain.
- Seasonal grasshoppers are attracted by airport lighting.

- Animal slaughterhouses and Markets with unprotected waste/garbage disposal facilities.
- Swampy lands
- Bird roosting and nesting sites near the airport.
- Kigali dumpsite near the airport about 5km.



Figure 84: Bird strikes trend at KIA per 10,000 aircraft movements

Birds can pose a significant hazard to aviation safety, as their collisions with aircraft can result in damage to the aircraft or even cause accidents. Therefore, it is necessary to take measures to reduce the risk of bird strikes in and around the airport.

Mitigation measures

- Ensuring that the construction site is kept clean and free from debris can reduce the likelihood of birds being attracted to the area. This includes removing food waste and other materials that could attract birds.
- Have a perimeter fence around the airport property to stop intrusion into the airside by livestock, stray dogs and other animals that may act as bird's attractant.
- Monitoring and ensuring proper waste disposal, in particular dumping sites, within and outside the airport to keep away scavenging birds. Engage contractors in waste management and disposal, grass cutting and bush clearing, this will help destroy birds' habitats within and outside the project site.
- Birds may find the airport the best place to breed, all nesting activities must be discouraged.
- Workers should be trained to recognize and respond to bird strike hazards. This should involve training on bird identification and behavior, as well as protocols for reporting and responding to bird strikes.
- Adhere to the existing KIA Wildlife hazard management.
- Management of insects through the removal of anthills, fumigation, and use of lights that do not attract insects.
- Ensure appropriate garbage management through the use of covered containers, and protected disposal areas with wire mesh.
- Carry out vegetation management by cutting in different sizes, cutting during off-peak hours, and collecting grass clipping from the runway strip immediately after cutting.
- Management of off-airport bird attractants within a 13km radius.

- Carry out bird scaring through the use of two vehicles, handheld lasers, bird scaring cartridges, distress calls, and siren.
- Regularly carry out pest control and treat termite nests on the airfield.

6.4.2.11 Air pollution

Taking into consideration that the project area is within and around Kigali international airport and considering traffic in the area, air quality is expected to be affected both during the construction and operation phases. Excavation and earth movement activities will be bound to raise dust levels around and in the project area and affect workers on site and people around the project site.

Increased dust levels are bound to affect people and personnel around the site as well as affect vegetation as the dust film on the leaves of plants will reduce their capacity to effectively undertake photosynthesis and therefore affect their growth. The site clearing and excavation works will produce fugitive dust which may result in increased levels of air borne particulate matter. This situation will be worse during the dry periods and prevailing winds. The occurrence of dusting is periodic and short-term, lasting only for the duration of the construction activity. The exhaust from construction machinery will be the main contributor during the construction phase. The emissions created in this process are atmospheric emissions among which the most important elements are dust (particulate) and sulfur dioxide. Other emissions to the atmosphere are carbon monoxides (CO) and carbon dioxides (CO₂) and fine particulate along the way because of diesel combustion. These will need to be monitored all through the construction period. This sustained high level of dust could impact negatively on various groups of the people who spend considerable time within the area adjacent to the project sites, such as construction workers, community around the project site and roadside businesses. Such emissions can lead to several environmental impacts including global warming and health impacts.

During the operation of the hangar and aviation training center, various activities can contribute to air pollution, including aircraft take-offs and landings, engine testing during practical learning, fueling operations, and aircraft maintenance. These activities generate dust, exhaust gases, and other pollutants that can cause harm to the environment and human health. Aircraft take-offs and landings emit exhaust gases containing carbon monoxide, nitrogen oxides, and other pollutants, contributing to smog formation and respiratory health problems. Engine testing also releases exhaust fumes, which can harm the environment and surrounding communities. Moreover, fuel spills during fueling operations can release hazardous pollutants into the air, exacerbating the negative impacts of air pollution. The accumulation of dust on aircraft parts and the runway can also create dangerous conditions, such as reduced braking performance and visibility, during takeoff and landing.

Mitigation measures

Construction phase

- Vehicle speed limitations, particularly close to sensitive receptors (typically <20 km).
- Restriction on vehicular usage in off-road areas (e.g., tracking vehicles with GPS system).
- Managing dust during major winds.
- Minimizing dust from material handling sources, such as conveyors and bins, by using covers and/or control equipment (water suppression, bag house filters or cyclones).
- Minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and increasing the moisture content.
- Dust suppression techniques, such as applying water or non-toxic chemicals to minimize dust

from vehicle movements.

- Management of emissions from mobile sources, including adequate maintenance of vehicle and equipment.
- In case of vehicle- related spills a rapid response team will be formed, trained and be on standby to be mobilized in the event of spillage of hazardous materials.

Operation phase

- Optimize aircraft movements on the ground to reduce taxiing and therefore reduce NOx and SO2 air emissions.
- Implement landing and take-off procedures that minimize air emission impacts by reducing the duration of the landing phase and optimizing climb performance.
- Ensure efficient energy consumption where possible and maintained according to the manufacturers' recommendations.
- Where possible, use jet fuel with the lowest possible Sulphur content (i.e., use of GTP jet fuel), to further reduce aircraft SO2 air emissions.
- Regular vehicle maintenance with monitoring and enforcement of emission standards.
- Ensure the use of low-emission aircraft in the hangar and within academy practical training. This will reduce the emission of harmful pollutants, such as carbon monoxide and nitrogen oxides.
- Regular maintenance checks to ensure that engines and equipment run efficiently, reducing the release of pollutants.
- Implement fuel spill prevention measures such as proper training of personnel, spill response plans, and using spill containment equipment to prevent fuel spills and their subsequent release of hazardous pollutants into the air.
- Regularly monitor the air quality around the hangar and academy to identify any potential air pollution issues and take corrective measures promptly.
- Regular sweeping and cleaning of the runway and surrounding areas to reduce the accumulation of dust and other particles.
- Apply dust suppressants such as water or dust control agents on the runway and surrounding areas to minimize the generation of dust during aircraft operations.
- Regular cleaning of aircraft engines can help to reduce the amount of dust and other particles that are stirred up during takeoff and landing.

6.4.2.12 Noise Pollution

Noise is an unwanted sound that can affect job performance, safety, and health. Psychological effects of noise include annoyance and disruption of concentration. Physical effects include loss of hearing, pain, nausea, and radiofrequency interference with communications when the exposure is severe.

Airports can be noisy places due to the high levels of activity, including the takeoff and landing of planes, ground handling, and airport operations. The noise generated by aircraft engines can be particularly loud, and this can be a concern for people living near airports. The noise level of Airbus Boeing type aircrafts, which are widely used in the medium category all over the world, is around 93-94 decibels.

Activities associated with the Aircraft hangar and CoE aviation training center construction will cause an increase in noise levels in the surroundings of the construction sites. The development of this project will result in increased ambient noise levels and vibration owing to the nature of machinery in use and the activities such as drilling, excavation, and night-time construction. The construction works, delivery of building materials by heavy trucks and the use of machinery/equipment including bulldozers, generators,

metal grinders, and concrete mixers will contribute to high levels of noise and vibration within the construction site and the surrounding area. The normal levels of 55 decibels (dB) recommended by the World Health Organization (WHO) will be surpassed in the duration of the construction process. The proposed project might involve the use of heavy equipment (graders, drilling equipment, trucks, blasting equipment, tractors, and excavators among others) for excavation and vehicular movement that emit incessant noise usually harmful to the environment.

During the operation phase, flight training activities such as touch-and-go landings, low-level flights, and aerobatics can generate significant levels of noise that can be disruptive. Given that there are existing aircraft operations in the airport, the engines of aircraft will continue generating noise during takeoff and landing. This noise can be a significant source of noise pollution, especially for communities located near the airport. Ground equipment such as air conditioning units, generators, and other machinery will also generate noise that can be heard by nearby residents.

Mitigation measures

Construction phase

- Construction activities will be scheduled during off-peak hours to minimize the impact of noise from construction machinery and nighttime uses of certain noisy machines will be regulated.
- Noise-reducing technologies such as low-noise equipment and machinery should be used to reduce the overall noise generated during construction.
- The use of heavy machinery and pneumatic pressure drills for rock blasting shall be kept to a minimum during the construction activities.
- The project area will also be surrounded by a buffer screen of aluminum sheets and screen meshes to reduce the impact of noise from the project site.
- Heavy machinery and vehicles to be used by the project will be in good condition and emit low noise levels.
- Before hiring a supplier, the contractor has to make sure that suppliers' vehicles have a valid vehicle technical control certificate.
- Use of appropriate protective equipment (PPE) such as ear protectors.
- Check the performance of the major equipment periodically, to troubleshoot and fix the problem by lubricating, repairing, etc.,
- Avoid queuing vehicles on the access road or at the site access points and adherence to speed limits.
- Regular noise monitoring will help to identify areas where noise levels are exceeding acceptable limits, allowing for targeted noise mitigation measures.

Operation phase

- Implement noise abatement procedures that reduce the impact of aircraft noise on nearby communities. This can include restrictions on flight training activities during certain hours or limiting the use of certain types of aircraft.
- Conduct regular community outreach and engagement activities to communicate with nearby residents about noise abatement measures and address any concerns they may have.
- The design of the site makes use of the steep slope by incorporating the academic block in a manner that aligns with the topography. This, in turn, presents an advantageous situation for the training center buildings that are situated below the KIA runway level, resulting in them being unaffected by the noise from the aircraft.

Socio-economic environment**6.4.2.13 Fire and Electrical hazards**

Major and common causes of fires and electrical hazards which occurred in Rwanda include Arson (intentional burning or due to recklessness), poor electrical installations; short circuits, glutted use of electrical equipment (excess voltage); mishandling of dangerous and flammable substances like petrol, lanterns, candles, and matches; and even the proliferation of counterfeit electrical equipment and materials used in houses and buildings in general. The increasing number of fire triggers due to the rapid urban expansion such as petrol depots and stations, huge kitchens in commercial buildings, low compliance to fire safety regulations and the general lack of awareness on fire hazards, fire safety and management, among others has significantly increased the risks to fires in Rwanda.

With such fire and electrical hazards taking place it is comprehensible that during the construction phase they may occur since there will be different activities that may cause such incidents such as welding, flammable substances like petrol from vehicles that may be ignited to cause fire and others. Whereas during installations of electricity as well, some workers may be electrocuted resulting into an electrical hazard.

Electrical and fire hazards may arise during the establishment's operational phase as a result of the buildings' reliance on electrical circuits for power consumption, and as a result of operations and maintenance being carried out in the hangar that may require more energy and higher voltages, that could result in a fire and electrical hazard if caution is not exercised.

Mitigation measures**Construction phase**

- Workers handling electricity and related components will be provided with shock resistant gloves, shoes, and other protective gears.
- Adequate training regarding health and safety will be provided to the workers.
- A health, safety, and environment (HSE) management system should be developed, rolled out and implemented.
- Access to areas containing exposed electrical equipment (such as transformers) shall be fenced and locked.
- Warning signs shall be posted at hazardous locations.
- Use non-combustible materials and insulation to help mitigate the spread of fire.
- Provide adequate personal protective equipment.
- Where possible, install transmission cables underground in accordance with existing best practice guidelines for underground cable installation, otherwise, install aboveground cables with proper insulation.
- In case of a fire incidence during the construction of the hangar, utilize the existing firefighting equipment present at the airport.

Operation phase

- Regularly conduct fire risk assessments and strictly adhere to the established regulations and safety best practices.
- Regular inspections and proper maintenance completed by qualified personnel are important to ensure fire safety.
- Firefighting equipment such as fire extinguishers, sand buckets and fire hydrants should be provided at strategic locations to deal with any incident of fire.

- The facilities should be outfitted with lighting protection and earthing equipment.
- Put in a place fire detection and warning systems.
- There will be anti-static mats that will prevent the build-up and discharge of static electricity.
- The workers handling electronic assembly and grounding cables will have to wear wrist straps to prevent electrostatic discharge.

6.4.2.14 Waste generation

The proposed Aircraft hangar and aviation training center project is expected to generate many wastes given an estimated daily presence of 400-500 students plus additional staff and other people accessing the facility. Solid, liquid and E- wastes is a great threat to the community and environment as whole if not well handled. Solid waste will be produced from vegetation clearance of the building sites, as well as from various packaging materials and other waste from human consumption.

During the construction and operation phase, a considerable quantum of solid wastes generated at the project site would be inert waste, which largely comprises of sand, construction debris and biomass from land clearing, gravel, untreated wood, concrete, asphalt, pipes, conduits, light steel material, stone, bricks, metal, ceramic tiles, glass and plastics, paper, food items, and few hazardous wastes such as sewage, batteries, waste oil including machinery fuel and lubricants, waste oil filters and oily rags, and cables containing substances.

Waste streams for which high quantities of waste are anticipated to be produced comprise excavated soil and organic material during excavation and site clearance. High quantities of packaging waste predominantly comprising plastic packaging and films (not plastic bags), paper and cardboard are also anticipated during the construction phase. Dismantling of the camp site and other infrastructure will also contribute to the generated waste.

Impact from proposed projects waste may arise owing to the shortage of dumping sites, increase in transportation and disposal cost and environmental deterioration. Potential pollution problems during construction activities include dumping of construction debris into drainage structures built alongside the boundaries of the proposed site. If not properly disposed, these wastes will result in the pollution of soil, groundwater, and air. Materials consisting of chemicals e.g., paints, cement and thinners will alter the chemical composition of these regimes.

Water will be consumed in various processes like drinking, cooking, flushing, floor washing etc. and gardening. After this consumption, wastewater will be generated in significant amounts. Sewage includes human waste. Effluent/sewage resulting from sanitary facilities and wastewater from washrooms is significant to the environment as well as that generated by the school hostel. It must never encounter the surrounding i.e., water, soil, air etc. Assuming a modest consumption rate of 30-50 cubic meters per day during construction and 20-35 Cubic Meters during operation this is a substantial amount and where treatment is not adequate, it could result in contamination of water resources from effluent directed to the drainage structures that could feed to other surface water bodies as well as leach to the groundwater.

Table 12: The types of wastes that are anticipated to emanate from the proposed project.

Construction phase wastes
Timber
Metal
Reinforcement bars
Ballast
Sand
Cement
Packaging material and containers e.g., paint pails, cement bags and metallic straps. Nails
Glass
Ceramic tiles
Plastic piping
Excavated soil
soil and rocks
Paint
Decommissioning Phase
Debris (concrete)
Nails
Metal scrap and cut-off
Building blocks/bricks and concrete rubble
Waste timber
Wire
Piping
Plastic

Roofing tiles
Reinforcement bars

The proposed project is expected to produce various types of waste from its operations in the hangar and academy. This waste will include large amounts of biodegradable waste such as food waste and packaging waste made mostly of plastic packaging and films (excluding plastic bags), paper and cardboard, due to the high number of students, employees, and visitors who will be using the academy. Additionally, significant amounts of non-hazardous waste, such as packaging materials, paper waste, and batteries, as well as hazardous waste, such as fluorescent bulbs and electronic waste, are expected to be generated. Waste from aircraft maintenance, such as oil, hydraulic fluid, brake pads, tires, and other parts that need to be replaced, will also contribute to the overall waste generated by the hangar.

Table 13: The types of wastes that are anticipated to emanate from the proposed project operation.

Waste Type
Scrap metal
Putrescible waste including food waste
Wooden pallets
Vehicle tires
Plastic
Paper/cardboard
Municipal waste
Glass
Sewage
Waste electrical equipment
Waste oil including plane fuel and lubricants
Waste oil filters and oily rags
Grease and cooking oil
Batteries
Medical waste
Chemicals
Cables containing substances

Waste sludge from runway oil/water interceptors and wastewater treatment facilities

Improper and indiscriminate disposal of E-waste mostly from aircraft repairs, cables and gadgets generated from hangar and aviation academy training center as well as those generated during construction, is likely to lead to the mushrooming of informal waste disposal centers in neighborhoods which further exacerbates the problem of E-waste where informal E-waste handlers, refurbishes or recyclers are exposed to the adverse health impacts of E-wastes because of lack of personal protective equipment and skills to dismantle the wastes.

Mitigation measures

Construction phase

- Appropriate location /containers for separation and temporary storage of general wastes on site.
- Identify and segregate non-hazardous wastes for reuse, recycling, and disposal of hazardous wastes at appropriate treatment facilities.
- Establishment of regular disposal to licensed third party dumpsite or recycling where possible.
- All waste storage units to always be covered and spill kits available.
- Clean up exercises will be regularly undertaken every end of the day to retain cleanliness within the construction site.
- The site supervisor should ensure that the washing of trucks, equipment and machinery at the site is done appropriately, draining the wastewater properly.
- Workers at site will also be clearly briefed on proper disposal of solid waste and the disposal area will be clearly marked.
- The contractor and the site supervisor should erect warning signs against littering and dumping within the construction site.
- Temporary ecosan toilets to be located within the construction area and offsite treatment recommended. There should be regular maintenance of the temporary ecosan toilets, including the emptying of effluent storage tanks.
- Waste Management Plan (WMP) that aligns with the existing KIA plan will be followed for ongoing monitoring and audits.
- Inventory control to reduce the number of wastes resulting from materials that are outdated, off-specification, contaminated, or damaged.
- Re-using materials on site wherever possible, especially the excavated materials. Topsoil and overburden must be kept nearby for eventual use as rehabilitation material once the spoil disposal sites are no longer required.
- Appropriate waste disposal site(s) for excavation material disposal, away from sensitive ground water features, community used land.

Operation phase

- Collection of garbage from the proposed project buildings before its decomposition and implement a waste management handling procedure.
- Identify a suitable separate temporary storage location for each waste stream that is adequately covered.
- Separate storage areas for hazardous and non-hazardous wastes will be organized in an appropriate way, and special segregation and treatment for electronic wastes.
- As much as possible, practices that minimize waste are to be practiced and encouraged.
- On-site composting of organic wastes could be explored as a viable option to minimize wastes and possibly in connection with gardening.

- Wastewater treatment plants have been designed for treating sewage during operations of both the hangar and academy. Ensure effective water treatment plant for wastewater recycling and treatment and the greywater for further reuse.
- The project proponent will ensure that there are people responsible for the monitoring of efficient operations of the treatment plants.
- The design should ensure the wastewater treatment plants are placed to the lowest parts of the sites to benefit gravity.

6.4.2.15 Accidental spills, leakage & discharge

The building and operation of an aircraft hangar and aviation training center could have a significant negative impact on the environment, particularly in the event of accidental spills, leaks, and discharge. Such incidents could result in soil and water pollution, as well as air pollution. Common sources of pollution during the construction phase include dust, bentonite, suspended particles, oils, hydrocarbons, cement, concrete products, heavy metals, and metalloids. These pollutants can come from a variety of sources, such as excavation, stockpiling, fuel storage tanks, routine use of bitumen and batching plants, maintenance of equipment, machinery, and vehicles, as well as accidents and spills.

During the operation of the proposed project, there is a risk of accidental spills, leakage, and discharge of various substances. These substances include fuels such as diesel, gasoline, and jet fuel, lubricants like grease and oil, hydraulic fluids, cleaning chemicals, and other hazardous materials that are used in aircraft maintenance and operation. Fuel spills and hydraulic fluid leaks can occur during fuel storage tank maintenance, refueling operations, routine maintenance, and equipment malfunctions. Cleaning chemical spills can also occur during aircraft cleaning operations, which may cause harm to personnel and the environment. In such instances, there is a risk of soil and groundwater contamination, potentially leading to harm of natural surroundings and vegetation. Fuel spills can also increase the risk of fire hazards, which can result in property damage or harm to personnel. The negative consequences will be exacerbated during periods of heavy rainfall, which can cause significant runoff. Failure to implement adequate pollution control measures may result in contamination of ground and surface water from spilled fuels and lubricants.

Mitigation measures

Continuous during both phases

- The Contractor should ensure that the employees on site are aware of the company Spill Prevention, Control and Countermeasure (SPCC) Plan for dealing with spills and leaks e.g., the guidelines stated subsequently (the contractor will propose a method of clean-up which will be subject to approval).
- Dripping pans to be used to contain all hydrocarbon leakages on construction equipment.
- Re-fueling on designated areas.
- In case of hydrocarbon spills, the contaminated soil will be collected and treated to remove the hydrocarbon and prevent the hydrocarbons from being washed away in storm water to the nearby water bodies.
- Appropriate materials handling and storage procedures, and development of contingency plans in the event of a spill.
- Spill kits should be readily available at all locations and training in how to use them provided to all personnel including drivers.
- Regularly maintain equipment, machinery, and vehicles to prevent leaks and other malfunctions that could result in spills.

- Regularly monitor the environment for any signs of contamination, to quickly identify and address any potential issues.
- Develop and implement an emergency response plan that outlines procedures for responding to large-scale spills or leaks.
- The developer should prepare and implement the WMP which include a hazardous waste management plan, which details procedures for the safe handling, storage, transportation, and disposal of hazardous waste generated by the project within the KIA to adhere to. By implementing the plan, the developer will ensure that waste is managed effectively and in compliance with regulations.

6.4.2.16 Insecurity

Security is an integral aspect of any development project, especially during the construction and operation phases. The aviation training center is no exception, as it attracts new people, including trainees and external users, who may have malicious intentions. Despite the implementation of tight security measures around the airport, there is still a possibility of security breaches resulting from anti-social behaviors.

Some of the security problems that may arise during the project include theft of machinery, equipment, and building materials, which can disrupt the project's progress and lead to financial losses. Additionally, the influx of people may increase the risk of Gender-Based Violence, sexual harassment, and other sexual offenses like rape. Business hubs may also take advantage of the project's workforce and community members by selling illegal drugs, further worsening the security situation.

Moreover, during the operation phase, vandalism and theft of equipment, materials and other items with a ready-made market may occur. It is, therefore, crucial to implement effective security measures that can prevent such incidents and ensure the safety of the project's personnel and the community.

Mitigation measures

Construction phase

- Active and inactive construction sites will be fenced until they are rehabilitated or the threat they pose is removed.
- There should be an offense and penalty system in place, and the community informed through appropriate public awareness programs.
- Adequate lighting should be provided for the construction sites.
- Vehicular movement will be closely monitored by the project manager to prevent theft.
- Security scanning measures will be implemented by the contractor at the entry points of the site to minimize theft and violence attempts.
- During construction, the selection of security providers will be carefully considered, rules of engagement will be established, and personnel will be trained. If there are security concerns, the proponent will engage a service to ensure security is maintained.

Operation phase

- The training center will have two entrances, with the main entrance being accessed from the lower part of the site through a tarmac road, and the academic block being adjacent to the main road. This will allow for efficient screening of personnel accessing these facilities.
- Recreational facilities within the training center will be located towards the periphery near the second entrance to minimize security risks and allow external users to access them.

- To prevent unauthorized access to restricted areas, security measures such as security personnel, ID card systems, metal detectors, and x-ray machines should be implemented at all entrances and exits.
- Ensure strategic installation of security cameras within and around the project facilities to deter criminal activities, detect security breaches, and assist in investigations.
- Trained security personnel should be present at various locations to monitor activities and respond quickly to security incidents.
- The proponent will develop an emergency response plan that outlines procedures to be followed during security breaches or emergencies.
- The National Civil Aviation Security Program guidelines should be followed during the operations of the aviation hangar and academy training center.
- Regular patrols, checks, and surveillance will be conducted by the developer to maintain security.
- Adequate lighting should be provided for the project facilities.
- There should be an offense and penalty system in place, and the community informed through appropriate public awareness programs.

6.4.2.17 Micro-climate modification

The process of constructing the project components will involve the removal of the existing vegetation cover in the area. This means that the natural ecosystem, which plays a crucial role in regulating the local climate and supporting biodiversity, will be disrupted. In addition to the direct impact on the vegetation, the construction activities will also result in significant greenhouse gas emissions and resource exploitation. The use of heavy machinery and transportation vehicles will contribute to the release of carbon dioxide and other harmful pollutants into the atmosphere, further exacerbating the already pressing issue of climate change.

It is apparent that the proposed facilities will mostly be built-up, indicating that there will be more concrete structures and paved areas within the development zone during the operational phase. These kinds of structures have the ability to reflect sunlight and alter the microclimate of the area. When shortwave rays from the sun are reflected off the ground surface, they are transformed into long wave rays, which cannot leave the atmosphere and result in warming the atmosphere. Hence, an increase in paved regions leads to an increase in long wave rays, which in turn modifies the microclimate. Moreover, the paved areas will retain heat during the day and release it at night when the land cools down. Additionally, the use of non-clean energy to fuel aircraft produces emissions that contribute to changes in the local climate.

The combined effect of all these activities will not only alter the immediate environment of the project site but also have wider-reaching impacts on the regional and global climate.

Mitigation measures

Construction phase

- At the beginning of the project, identify areas with minimal movement and plant trees in those areas.
- Local sourcing of construction materials will be prioritized to minimize carbon footprint and Co2 emissions.

- Sustainable building materials should be used to reduce emissions associated with their production, transportation, and disposal. Examples include low-carbon concrete, sustainably sourced wood, insulation made from recycled materials, etc.
- The entire project area should not be paved. Landscaping using grassy pavements should be integrated.
- The project proponent should plant as many indigenous species as possible.

Operation phase

- To minimize the surface area of the built environment and improve the area's overall aesthetics, fencing should primarily consist of chain-link and live fencing.
- The use of electric cars and pedestrian-friendly paving will be promoted for non-motorized mobility within the project facilities. The 1km road connecting the Hangar to the Academic block is proposed to be non-motorized.
- Regular maintenance and cleaning of aircraft engines and components will be performed to ensure peak efficiency and reduce emissions.

6.4.2.18 Disturbance to the existing scenery

The proposed location for the Aircraft hangar is within the Kigali international airport, which is predominantly covered by grass and has a flat terrain. On the other hand, the Aviation training center site is presently covered with natural vegetation and trees. The establishment of both the Aviation hangar and academy training center will cause a permanent change in the local scenery by transforming an open setting into a fenced built-up area.

While the construction is ongoing, there are anticipated temporary visual changes that may happen, such as the development of construction camps and related facilities, earth-moving activities, and storage of materials. Structures such as scaffolding, fencing, and signs may also obstruct the view. Additionally, the increase in vehicle traffic and use of heavy equipment within and around the project site and the utilization of security lighting may cause visual disruptions to the surrounding area. Furthermore, the generation of diesel fumes, dust, and debris from the construction process may also create visual disturbances, especially if proper control measures are not implemented.

The establishment of permanent structures above ground level, including a hangar and an 8-level training center, has the potential to disrupt the existing landscape due to the introduction of discordant features and activities. These structures are larger than nearby buildings, and the movement of aircraft in and out of the hangar can be visually noticeable to nearby residential areas. The hangar and training center require extensive lighting for maintenance and operations, which can be very bright and have a significant impact on the surrounding area, particularly at night. The presence of fences and other security measures may also have a visual impact, as well as equipment such as lifts, cranes, and fueling stations used in the hangar. Flight training activities involving the use of drones and aircraft movements may also disturb the surrounding community visually, particularly during take-off and landing.

Therefore, to minimize the visual impact on the surrounding area, project components should be designed to blend well with existing structures and complement the environment.

Mitigation measures**Construction phase**

- Ensure soil heaps and stockpiles adhere to size and duration restrictions, and materials are transported to the site with minimal visual disturbance, preferably at night.
- The construction site should be fenced or hoarded off to prevent public view.
- Follow measures to minimize emissions to reduce disruptions to the visual amenity of the area.
- Conduct construction activities concurrently with landscape reinstatement processes and use selective shrub species for re-vegetation and reinstatement wherever possible.
- The contractor should manage lighting appropriately during the construction phase.

Operation phase

- Incorporate suitable green spaces in the design with diverse flora species to give off a green ambience and retain key landscape features.
- Use trees, landscaping elements, walls, or fences to screen the hangar from view and reduce its visual impact.
- Establish an effective balance between safety/security and environmental sensitivity when designing light sources and minimize the illumination of building facades to lessen their prominence after dark.
- The architectural design of the hangar should be a sympathetic low-rise building.
- Use non-reflective surfaces and materials with sensitive and uniform coloration paint specifications for the hangar and academy training center facilities to blend in with the surrounding landscape.
- The landscape plan and design should have an open space character that blends into the existing scenery, and ample recreational facilities within the building.
- Limit the operating hours of the hangar and schedule training activities during less disruptive times to reduce visual impact.
- Engage with local communities to address concerns about visual impacts, build support for the center, and minimize potential conflicts.

6.4.2.19 Traffic Congestion

The KMPU Interim Master plan traffic report utilized traffic counts to identify the highest volume of traffic during peak hours in the morning and afternoon. This information was then used to evaluate the capacity of intersections. Specifically, in the Kigali International Airport (KIA) area, where the proposed project will be located, five intersections along the KN5 major arterial road leading to the airport were studied. The report recorded peak traffic periods during the morning and afternoon. The following peak periods were observed:

- The peak period for intersection 1 (KK103 St/ KK 5 Ave) occurred between 06:45 AM and 07:45 AM as well as between 17:00 PM and 18:00 PM. The highest volume occurs at 07:30 AM and 17:15 PM.
- The peak period for intersection 2 (KN5/KK3) occurred between 06:45 AM and 07:45 AM as well as between 17:00 PM and 18:00 PM. The highest volume occurs at 07:30 AM and 17:30 PM.
- The peak period for intersection 3 (KN5/ KG109) occurred between 06:45 AM and 07:45 AM as well as between 17:00 PM and 18:00 PM. The highest volume occurs at 08:15 AM and 18:00 PM.

- The peak period for intersection 4 (KN3/KN5) occurred between 07:15 AM and 08:15 AM as well as between 17:00 PM and 18:00 PM. The highest volume occurs at 08:00 AM and 18:00 PM.
- The peak period for intersection 5 (KN 5/ KG1) occurred between 07:30 AM and 08:30 AM as well as between 17:00 PM and 18:00 PM. The highest volume occurs at 08:15 AM and 18:00 PM.

It is important to analyze traffic patterns on roads that lead to the airport, as this information is crucial in determining how any future development in the area may contribute to the existing traffic flow.

During the construction phase, the movement of trucks and vehicles carrying building materials can cause traffic congestion, resulting in delays in construction work and tardiness of some employees. This is mainly due to the fact that the peak traffic hours are usually during mornings and evenings when people are commuting to and from work. The increased traffic caused by the construction activities can exacerbate the situation, making it difficult for people to reach their destinations on time.

Furthermore, during the operational phase, traffic congestion is expected to worsen due to increased vehicular movement to the training center. The increase in traffic can cause delays and frustration, especially during peak hours. Additionally, the use of a single runway for both training airplanes and commercial airlines may lead to air traffic problems, which can cause conflicts and delays for both parties. This can be particularly challenging for student pilots who need to complete their training on time to meet their certification requirements, and for commercial airlines that need to adhere to strict schedules. Therefore, it is essential to put in place preventive measures to ensure that these potential conflicts are avoided, and all parties can operate smoothly and efficiently.

Mitigation measures

Construction phase

- Traffic signs limiting speed should be installed in the surroundings of the site to reduce and offset the damage resulting from congestion.
- Exit and entrance points should be well indicated to minimize jams and traffic accidents around the site.
- The contractor should provide temporary road signs or notices to indicate ongoing works and sensitize the nearby communities about the increased traffic.
- The contractor should sensitize project drivers on accident risk and control measures, as well as compensate victims of accidents.
- Materials hauling to tipping site and vice versa should be carried out during off peak periods.
- Develop a traffic management plan.

Operational phase

- The developer intends to collaborate with the existing KIA Air Control Tower to prevent any air traffic that may arise and establish a specific flying schedule for their academy's students.
- The developer is required to conduct a thorough risk assessment to identify possible hazards that may arise from air traffic, accidents, and collisions during training, as well as any other potential accidents that may occur at the hangar site and during training.
- The design has considered the provision of alternative access points to the academy training center, which would be separate from the existing access points that are accessed via the main road leading to the airport. This is intended to reduce traffic congestion on the existing road.

6.4.2.20 Spread of Diseases

During the construction phase, communicable diseases like HIV/AIDS and other STDs can be a significant concern due to the behavior patterns of irresponsible workers, migrants from other countries, and individuals in the surrounding areas. As the development progresses, the health of workers on-site will be a significant priority. The food provided to the construction workforce could potentially compromise the health of workers, especially if it is prepared in unhygienic conditions. Other health issues can arise from the cleanliness of the working area. If sanitation measures are not adequately implemented, it can lead to acquiring various diseases such as cholera, malaria, and other illnesses.

Aircraft hangars and aviation training centers are shared spaces where individuals from diverse backgrounds gather to work and learn. Consequently, there is a high probability of sanitary problems and the transmission of diseases, particularly if appropriate hygiene practices are not followed. Sanitary challenges that may arise in these facilities involve the dissemination of viruses and bacteria, the build-up of dust and debris, the infestation of pests, and the existence of stagnant water, thus leading to various health issues.

Mitigation Measures

Construction phase

- Workers should be educated to adhere to basic rules regarding protection of public health, including most importantly hygiene and disease prevention, HIV and AIDS and STIs prevention and response campaigns.
- Establish a partnership with local wellness centers including hospitals, VCT and ARV centers and NGOs near the project area for implementing an HIV/AIDS prevention and response program.
- Construction workers to undergo health screening according to the National HIV/AIDs Policy.
- The engineer and contractor should engage qualified professional safety staff to develop a detailed, site-specific worker health and safety management plan.
- Cleaning up excessive waste debris.
- Engage trained personnel to identify and selectively remove potentially hazardous materials in building elements that may pose health concerns.
- Adequate sanitary facilities will be provided, and standard cleanliness maintained.

Operation phase

- A clinic and nurse room will be provided for the facilities, easing access to health care, during the operation phase of this development.
- Regular cleaning of the different areas in the facilities to avoid any sanitary diseases that occur due to uncleanness.
- Sensitize workers and the surrounding communities on awareness, prevention, and management of HIV/AIDS through staff training, awareness campaigns, multimedia, and workshops.
- Establish a partnership with local wellness centers including hospitals, VCT and ARV centers and NGOs near the project area for implementing an HIV/AIDS prevention and response program.

6.4.2.21 Gender-Related Impacts

The construction industry is traditionally male-dominated, and women usually face barriers to entering the industry. This could result in fewer female workers being employed, which could reinforce gender disparities. During the construction phase of a project, there is a possibility that gender inequality may primarily affect women. This could manifest through various means such as unequal allocation of work, discriminatory practices, and inequitable compensation.

Additionally, women seeking employment may be subjected to demands for sexual favors as a prerequisite for employment or even after being hired, which would constitute sexual harassment. Furthermore, women in the vicinity of the construction site or workplace may also face verbal harassment in the form of derogatory remarks, as well as unwanted physical gestures and contact from construction workers. It is essential to acknowledge and address these potential risks to ensure a safe and equitable work environment for all employees and members of the community.

During the operation phase, women may be subject to gender bias in performance evaluations, which could limit their opportunities for career advancement. If there is a perception that women are less competent or less committed to their work than men, this could result in unequal treatment and fewer opportunities for advancement.

The culture of the aviation industry may still be male-oriented, and this could lead to a less welcoming environment for female employees. Women may face discrimination or harassment on the job, which could create a negative experience and discourage them from pursuing careers in aviation.

Mitigation measures

Both construction and operation phases

- Enforce a comprehensive anti-sexual harassment policy that outlines zero tolerance for any form of sexual harassment or gender-based violence in the workplace.
- Provide training for all construction workers and supervisors on gender sensitivity, gender-based violence, and sexual harassment prevention.
- Ensure gender balance in the recruitment and hiring of workers and provide equal opportunities for women to participate in all aspects of the scope of work.
- Promote the use of personal protective equipment (PPE) that is gender-sensitive and appropriate for both male and female workers.
- Conduct regular monitoring and evaluation of the construction site to identify any potential gender-related issues and address them immediately.
- The design has considered providing for separate accommodation facilities for both women and men, as means of promoting gender-sensitivity.

6.4.2.22 Energy consumption

Currently, the airport relies on the national grid to provide electricity for lighting purposes. The construction and operation of the hangar and academy training center within the airport and airport boundary will lead to an increase in electricity demand. During the project's construction phase, the aircraft hangar facility is expected to consume approximately 200 to 300 kilowatt-hours (kWh) of electricity, while the aviation training center facility will require 400 to 600 kWh. Once the facilities are operational, the hangar will require between 100 to 250 kWh of electricity, while the aviation training center will require between 250 to 400

kWh. This increase in demand may put a strain on the existing electrical infrastructure in the Kicukiro district, where 91.5% of households already depend on electricity from the national grid.

The increased demand for electricity will cause the public distribution line to overload and result in insufficient power voltage for the hangar. This could lead to a negative impact on both the airport and the surrounding community. The airport will face delays or disruptions to its operations, affecting flights and passenger experience. The surrounding community may also face power outages, which can cause inconvenience and even safety hazards, especially if it happens during extreme weather conditions.

Moreover, the increase in demand for electricity may also lead to an increase in electricity prices. The existing infrastructure may struggle to keep up with the surge in demand, and as a result, electricity prices may go up to cover the cost of supplying electricity. This can lead to a financial burden on both the airport and the surrounding community, affecting their ability to invest in other important projects.

Mitigation measures

Construction phase

- Promote energy-saving practices, such as turning off equipment when not in use, optimizing equipment settings, and reducing unnecessary energy consumption.
- Select energy-efficient temporary power systems and generators that match the site's needs and avoid oversized equipment.
- Educate construction personnel on energy-saving practices and encourage responsible energy use throughout the project.
- Optimize material choices and construction techniques to minimize energy-intensive processes, reducing overall electricity consumption.

Operation phase

- Minimize heat gain, improve indoor thermal comfort, and reduce the energy for conditioning the indoor environment through efficient design of building's western façade.
- Ensure connectivity between the interior and the exterior environment, by providing adequate daylighting.
- Ensure the use of energy efficient lighting to minimize energy consumption from lighting usage while maintaining proper lighting level.
- Encourage the use of energy efficient lifts and escalators. Lifts and/or escalators equipped with AC Variable Voltage and Variable Frequency (VVVF) motor drive and sleep mode features.
- Encourage the use of on-site renewable technologies, to reduce the net demand for fossil fuel energy and the environmental impacts associated with it.
- Encourage use of solar energy for water heating applications in the building, to reduce the overload to the public distribution line.
- The design should consider the use of an efficient air-conditioning system where required to reduce energy use.
- Ensure optimized energy usage by installing solar panels on the roof that are positioned to receive maximum sunlight radiation. An aeronautical study will be conducted to assess the impact of solar panels on aviation activities.
- The electrical design has considered the use of energy-efficient LED lighting for lighting and motion sensors for handwashing, further promoting energy efficiency.

6.4.2.23 Water consumption

The implementation of the proposed project will require a substantial amount of water, which may cause a water shortage in the surrounding area. Water is a crucial resource for construction activities, and the project's demand for water may lead to an increase in water demand, resulting in a shortage of water supplied by the Water and Sanitation Corporation (WASAC) in the surrounding area. This is considered a cumulative impact since the construction of the proposed hangar will draw approximately 10 to 30 cubic meters of water per day, while the proposed training center draws up to 20 to 40 cubic meters of water per day during the construction phase.

During the operational phase, the hangar and training will require 8 to 20 and 15 to 25 cubic meters of water per day respectively, from municipal sources, which will further increase the demand for water from WASAC in the surrounding areas. This increase in water demand could lead to WASAC struggling to keep up with the demand, resulting in a water shortage in the surrounding areas.

The shortage of water can have several negative impacts on the surrounding area, including hindering the construction activities, affecting the health and wellbeing of the surrounding community, and potentially disrupting the operations of the project. The shortage of water can cause delays in construction activities, which can lead to a delay in project completion, resulting in additional costs. Moreover, the lack of water can lead to health issues such as dehydration, and it can also limit the availability of water for personal hygiene, which can lead to hygiene-related diseases.

Mitigation measures

- During construction, temporary cisterns may be built to capture rainwater and supplement water needs.
- Water systems shall be designed with conservation in mind recognizing water as a precious resource at the building site and regional scale.
- The contractor will install water-conserving taps that turn off automatically when water is not being used. The site supervisor will always ensure that no water is left unattended to.
- The developer should provide water metering and pressure reducing valves as a management technique of water usage that avoids unnecessary wastage of water, ensuring its proper usage. This will result in less demand, hence the amount of water to be supplied will be reduced.
- The developer has considered in the design recycling/reuse of water at the establishment time where possible.
- The project includes a design feature that collects rainwater from the roof and channels it into an underground tank for treatment and future use.
- The project includes a wastewater recycling and treatment plant in its design, which will enable the reuse of treated wastewater and lead to a reduction in overall water consumption.

Operation phase

Physical environment

6.4.2.24 Storage and handling of hazardous materials

Due to the presence of features like battery storage and charging stations, tools room, aircraft instruments and electronics labs, fuel storage and dispensing areas, welding and cutting areas, engine testing areas, and hydraulic systems in the planned aircraft hangar and aviation training center, it's possible that they could contain a variety of hazardous materials.

These hazardous materials may include aviation fuels, lubricating oils, and hydraulic fluids which are flammable, toxic, and explosive. Other hazardous substances that may be found include chemicals for aircraft maintenance like solvents, acids, and caustic materials, which can be corrosive, toxic, or flammable. Compressed gases like oxygen, nitrogen, and helium can also pose a hazard due to their high pressure and potential for explosion. Aircraft batteries containing lead and sulfuric acid, welding and cutting materials used in aircraft maintenance, and equipment that uses radioactive materials such as radiography equipment for non-destructive testing are other potential hazards that may be present in some aviation facilities. Furthermore, there is a possibility of hazardous materials such as lead, mercury, and cadmium being present in outdated electronic devices like computers, monitors, and other equipment. Aviation facilities may also have metal shavings, contaminated soil, and solvents which could pose a threat. The use of disinfectants such as chlorine for cleaning swimming pools and water treatment plants could also present potential hazards in these facilities.

Improper handling of these materials can lead to several environmental and health concerns. These include contamination of soil and groundwater due to leaks, spills, or improper disposal of hazardous materials. Additionally, the release of carbon monoxide, nitrogen oxides, and particulate matter into the air can result in air pollution, which can cause respiratory problems and other health issues. There is also a risk of fire and explosion, as well as potential health and safety risks from exposure to these hazardous materials.

Mitigation measures

- The developer should implement the WMP which includes a hazardous waste management plan, which details procedures for the safe handling, storage, transportation, and disposal of hazardous waste generated by the project within the KIA to adhere to. By implementing the plan, the developer will ensure that waste is managed effectively and in compliance with regulations.
- Hazardous materials should be stored in appropriately secured, segregated, and labeled containers and areas, to minimize the risk of leaks and spills. Separating hazardous waste into different categories can help ensure that each type is properly stored and disposed of.
- Implement sustainable waste management practices, such as reducing waste generation, recycling, and reusing materials where possible.
- Hazardous waste should be disposed of in accordance with the existing regulations. This may involve working with a licensed hazardous waste disposal company to ensure that the waste is transported and disposed of safely and legally.
- Carry out regular inspections and monitoring to detect leaks and other issues before they become significant problems. Monitoring can also help ensure that hazardous materials are being stored and handled appropriately. These inspections should include a review of the containers, storage areas, and spill prevention measures.

- Regular environmental monitoring can identify potential impacts of hazardous waste storage and handling, including air and water quality monitoring and soil testing.
- Develop spill response plans that include procedures for containing and cleaning up spills, as well as proper disposal of contaminated materials.
- Regular personnel training on the risks and handling techniques associated with hazardous materials should be provided.
- Use secondary containment methods like spill containment pallets or berms to prevent spills or leaks from hazardous waste containers.
- Proper ventilation can prevent toxic fumes or gases from hazardous waste buildup, protecting the health and safety of workers.
- Employees handling hazardous waste must wear appropriate personal protective equipment to prevent exposure.
- Anti-static mats and humidifiers can be used to prevent the buildup of static electricity in the workplace.

6.4.2.25 Swimming pool safety

Given that the proposed aviation training centre comprises of recreational spaces such as the swimming pool, there may be situations where contamination has been introduced into the pool area from a faecal incident, vomit, blood, or the discharge of storm or sanitary sewage into the pool or on the pool deck. Therefore, the developer needs to provide a contingency procedure for dealing with both limited contamination and gross contamination. Limited contamination is defined as a contamination event where the amount of contamination is not sufficient to consume the disinfectant residual present in the swimming pool. In addition, the swimming pool management is required to develop a response plan for rescues and submersions, equipment failure, injury requiring medical attention, and other conditions or events that create a hazard to the health and safety of persons using the pool. Drowning is one of the major causes of accidents resulting in serious injury and death in children. Accidents in the swimming pool can happen very suddenly without warning. It is very important that the academy training centre follows basic safety precautions.

Mitigation measures

- Outline the steps necessary to protect the health and safety of those using or operating the pool.
- Make available a list of contacts, and this should be on the first page of each plan. The list should include the name and telephone number for emergency services such as emergency medical assistance, fire department, aquatic professionals, and police department.
- As regard to rescue and submission, the first step is to assist the victim in leaving the pool, if possible, using a reach pole, ring buoy and line, spine board, or other appropriate means. The swimming pool instructor presence is required to assist and eventually rescue those still learning.
- Summon emergency medical assistance, if appropriate, and have qualified personnel administer cardiopulmonary resuscitation (CPR) or artificial resuscitation, if needed.
- Employ a security guard to make sure that people are not engaging in rowdy, dangerous behaviours.
- To prevent swimming pool accidents such as drowning, layers of protection are essential. Place barriers completely around the pool, closely supervise the people in the pool, and be prepared in case of emergency.

6.4.2.26 Swimming pool water and chemicals evaporation

The evaporation of swimming pool water and chemicals has multiple impacts. Firstly, it leads to water loss, straining local water resources and contributing to water scarcity. Secondly, the loss of chemicals through evaporation necessitates additional chemical usage, increasing costs and environmental impact. Evaporation also affects the environment by increasing humidity levels and potentially impacting air quality. Moreover, it results in energy loss, leading to higher energy consumption and operational costs.

However, by using pool covers to minimize evaporation, these impacts can be mitigated, promoting water conservation, reducing chemical usage, minimizing environmental effects, and improving energy efficiency in pool maintenance. In terms of safety, well-designed pool covers play a vital role in preventing accidents involving children and small animals. These covers act as protective barriers, significantly reducing the risk of drowning incidents. With their secure and sturdy construction, they offer an added layer of security and peace of mind to pool owners.

Mitigation measures

- Install a pool cover. As much as 70 percent of a pool's heat loss is caused by evaporation. It also will keep the pool or spa cleaner and reduce the need to add chemicals.
- Keep the pool's cleaning equipment clean and lubricated. Well-maintained equipment is more efficient and will last longer before it needs to be replaced.
- Switch the pool filter and sweeper operations to off-peak hours. Running pool equipment only during off-peak hours can save money.
- Install a water-saving pool filter. A single back flush with a traditional filter uses 180 to 250 gallons of water.
- Shorten the operating time for the swimming pool filter and use the automatic cleaning sweep. In the rainy season, two hours a day of filtering could cut the filter's energy use by 40 percent to 50 percent, without any noticeable difference in clarity or sanitation.
- Create a windbreak around the pool with native plants and shrubs. This windbreak will prevent breezes from reaching your pool and keep hot, dry air from sucking away moisture.
- Use "green" pool cleaning services, which involves filtering the pools contents and then pouring the water back in.

6.4.2.27 Swimming pool water quality

The impact of swimming pool water quality is crucial for the health, safety, and enjoyment of swimmers. Proper water quality ensures a safe environment by preventing the spread of waterborne illnesses and infections. Sources of contamination include people swimming in the pool, animals like dogs, and debris from the surrounding area. If not properly maintained, pool water can harbor bacteria and algae, leading to health issues. Maintaining the right chemical balance helps manage contaminants and protects pool equipment. Responsible water management practices and regular checks are necessary to ensure healthy water and minimize environmental impact. Swimmers should observe any changes in water clarity or appearance to address potential issues promptly.

Mitigation measures

- Treat and clean water of the swimming pool for efficient use of water resources and less pressure to water supply system.
- Regular monitoring of swimming pool water quality and check if the management meets the swimming pool water quality standards.

- Conduct regular testing of pool water parameters such as pH, chlorine levels, alkalinity, and sanitizer levels.
- Maintain and clean the pool's filtration system regularly to ensure efficient removal of debris and particulates from the water.
- Maintain the recommended disinfectant levels to ensure the water remains safe and free from harmful pathogens.
- Remove debris like leaves, grass, and insects from the pool regularly to prevent organic matter from decomposing and affecting water quality.
- Maintain and service pool equipment, including pumps, filters, and heaters, according to manufacturer guidelines.
- Provide guidelines and educate pool users on hygiene practices.

The water in swimming pools shall be maintained at the following water quality standards at all times:

(I) Physical Quality

(a) The pool water shall be clear and clean. No scum or floating impurities shall be allowed to accumulate. The colour of the water shall not exceed 5 Hazen units and the turbidity shall not exceed 5 NTU.

(II) Bacteriological Quality

(a) E. Coli shall not be present in any 100 ml sample of water taken from the pool.

(b) Not more than 10 coliform organisms shall be present in any 100 ml of water taken from the pool.

(c) Not more than one out of five consecutive samples of the water, taken monthly, shall contain any coliform organisms in 100 ml of the water sample.

(d) No sample shall contain more than 200 bacteria per ml as determined by the 24-hour plate count at 37 ° C or by the filter method.

(III) Chemical

(a) A free chlorine residual of not less than 1.0 mg per litre and not more than 3.0 mg per litre shall be maintained in the pool.

(b) If copper sulphate is used as an algicidal agent, copper sulphate concentration of the water determined as copper shall not exceed 0.2 mg per litre.

(c) The pool water shall have a pH value of between 7.2 and 7.8.

(d) If cyanuric acid is used as a stabilizer for chlorine (either separately or in combined form), its maximum concentration shall not exceed 100 mg/litre in the swimming pool water.

Socio-economic environment

6.4.2.28 Community Health and Safety

The proposed aircraft hangar and CoE aviation training center project has the potential to cause various health and safety risks to the community in the surrounding areas. The operation of aircraft used in training and operations can generate high levels of noise, which may disturb nearby residents and cause hearing damage. Additionally, the operation of an aviation academy training center can increase traffic and congestion, leading to accidents and reduced air quality. Aircraft and ground support equipment can emit

aviation fuel and exhaust emissions, resulting in air pollution, which can adversely affect the health of people, especially those with respiratory issues. The use of chemicals and hazardous materials during aircraft maintenance and repair can also expose staff and surrounding communities to risks.

Flight training can be a complex and risky operation that requires careful planning and execution to avoid accidents. One of the most significant risks associated with flight training is the potential for aircraft collision, which can result in catastrophic damage to the aircraft and surrounding infrastructure, as well as loss of life. Trainees who are inexperienced in operating an aircraft may make mistakes that can lead to accidents, such as incorrect procedures during takeoff or landing, misjudging distances, or altitudes, or failing to respond correctly to emergencies. These accidents can occur both within the airport facilities and in the surrounding communities, posing a threat to public safety.

Furthermore, if the aircraft used during training is not adequately maintained or operated by trained professionals, it can lead to accidents that can cause injuries or even fatalities for trainees, staff, and the community.

Mitigation measures

- Regular communication and feedback mechanisms with the community can help to establish trust and encourage community participation in safety measures, thereby promoting community engagement in ensuring safety.
- Encouraging the use of public transport or carpooling among staff and trainees can reduce traffic congestion and pollution.
- Installing noise barriers such as berms, vegetative barriers, or conducting training during non-peak hours can reduce the impact of noise on nearby residents.
- Regular maintenance of aircraft and ground support equipment can minimize the risk of accidents and exposure to hazardous materials.
- Develop a comprehensive risk management plan that identifies potential hazards, assesses the likelihood and severity of each hazard, and outlines mitigation measures to minimize or eliminate risks.
- Regularly inspect aircraft and ground support equipment to identify and address any potential safety hazards before they become accidents.
- Provide adequate training on emergency response procedures, including evacuation plans and fire safety, to ensure that staff and trainees are equipped to handle potential accidents.
- Use low-emission aircraft and ground support equipment, minimize engine idling, and ensure that fueling and maintenance operations are performed in compliance with environmental regulations.
- Establish guidelines for flight operations that minimize noise impacts.
- Develop and implement an emergency response plan that outlines procedures for responding to accidents and other health and safety issues that may arise.

Table 14: Impact matrix

Impacts	Duration	Intensity	Extent	Reversibility	Probability	Significance	
Bio-diversity loss	Short to medium term (2)	Moderate (3)	Site-specific (1)	Reversible (2)	Definite (5)	40	Medium-low
Bird strike hazards	Long term (4)	Moderate to high (4)	Local (2)	Irreversible (3)	Probable (3)	39	Medium-low
Increased runoff and stormwater	Medium term (3)	Moderate (3)	Site-specific (1)	Reversible (2)	Probable (3)	27	Low
Soil erosion and compaction	Short to medium term (2)	Moderate (3)	Site-specific (1)	Reversible (2)	Probable (3)	24	Low
Occupational Health and Safety	Short to medium term (2)	Moderate to high (4)	Site-specific (1)	Irreversible (3)	Probable (3)	30	Medium-low
Employment-labor issues	Short to medium term (2)	Low (1)	Local (2)	Reversible (2)	Probable (3)	21	Low
Impacts of worker-community interactions	Short to medium term (2)	Low to moderate (2)	Local (2)	Completely reversible (1)	Possible (2)	14	Very low
Impact on heritage	Short to medium term (2)	Moderate (3)	Local (2)	Reversible (2)	Possible (2)	18	Low
Child labor and abuse	Short to medium term (2)	Low (1)	Local (2)	Reversible (2)	Possible (2)	14	Very low
Damage to the utilities in the area	Short to medium term (2)	Moderate (3)	Local (2)	Reversible (2)	Probable (3)	24	Low
Air pollution	Long term (4)	Moderate (3)	Local (2)	Reversible (2)	Highly probable (4)	44	Medium-low
Noise pollution	Long term (4)	Moderate to high (4)	Local (2)	Reversible (2)	Highly probable (4)	48	Medium-high
Waste generation	Long term (4)	Moderate (3)	Local (2)	Reversible (2)	Highly probable (4)	44	Medium-low
Accidental spills, leaks, and discharges	Long term (4)	Moderate to high (4)	Site-specific (1)	Irreversible (3)	Probable (3)	36	Medium-low
Fire and electrical hazards	Long term (4)	Moderate (3)	Local (2)	Irreversible (3)	Highly probable (4)	48	Medium-high
Insecurity	Long term (4)	Moderate (3)	Local (2)	Reversible (2)	Possible (2)	22	Low

Aircraft hangar and CoE aviation training center

ESIA

Impacts	Duration	Intensity	Extent	Reversibility	Probability	Significance	
Micro-climate modification	Long term (4)	Moderate (3)	Site-specific (1)	Reversible (2)	Probable (3)	30	Medium-low
Disturbance to the existing scenery	Long term (4)	Moderate (3)	Local (2)	Reversible (2)	Probable (3)	33	Medium-low
Traffic congestion	Medium term (3)	Moderate (3)	Local (2)	Completely reversible (1)	Probable (3)	27	Low
Spread of diseases	Long term (4)	Moderate (3)	Site-specific (1)	Reversible (2)	Possible (2)	20	Low
Gender-related impacts	Long term (4)	Low to moderate (2)	Local (2)	Irreversible (3)	Probable (3)	33	Medium-low
Energy consumption	Long term (4)	Moderate (3)	Local (2)	Reversible (2)	Probable (3)	33	Medium-low
Water consumption	Long term (4)	Moderate (3)	Local (2)	Reversible (2)	Probable (3)	33	Medium-low
Storage and handling of hazardous materials	Long term (4)	Moderate to high (4)	Site-specific (1)	Irreversible (3)	Highly Probable (4)	48	Medium-high
Community Health and Safety	Long term (4)	Moderate to high (4)	Local (2)	Irreversible (3)	Probable (3)	39	Medium-low
Swimming pool safety	Long term (4)	Moderate (3)	Site-specific (1)	Irreversible (3)	Possible (2)	22	Low
Swimming pool water and chemicals evaporation	Long term (4)	Low to moderate (2)	Site-specific (1)	Completely Reversible (1)	Probable (3)	24	Low
Swimming pool water quality	Long term (4)	Low to moderate (2)	Site-specific (1)	Completely Reversible (1)	Possible (2)	16	Low

7.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

7.1 Introduction

The Environmental and Social Management Plan (ESMP) describes a course of action that will be implemented by the project to guarantee that environmental quality is preserved and enhanced during the project's lifespan. Environmental and social management plans have been created to complement the ESMP framework and to manage and mitigate the E&S issues related to the project development.

Adequate environmental management measures must be incorporated during all project phases, including planning, construction, and operation, as well as to allow for inclusive multi-stakeholder consultations and engagement, to reduce any adverse environmental impact and ensure sustainable development of the area.

The project may have a number of negative environmental effects. Yet, if proper environmental management procedures are put in place and followed, there would be very little negative impact or cause for alarm. Water, soil, and air pollution, as well as issues with health and safety, demand major mitigation measures.

The following negative effects on the environment and the social welfare of the people in the surrounding areas, are specific to the operations of the Aircraft hangar and CoE aviation training center:

- Bird strike hazards
- Waste generation
- Accidental spills and leaks
- Fire and electrical hazards
- Traffic congestion
- Storage and handling of hazardous materials
- Noise pollution
- Community health and safety

Training should be made available with adequate budgets to ensure that an ecologically sound performance is satisfactorily achieved in order to build institutional capacity in implementing and enforcing the ESMP. Technical skills in environmental assessment, environmental mitigation plans, and environmental monitoring should be included in the training program suggested here.

7.2 Policy

The development's management policy entails maintaining a clean and safe environment within the site and supporting environmental management efforts both within and outside the project by engaging in proactive and responsible activities.

7.3 Objectives

- Ensure environmental conservation and sustenance to ensure a balanced approach between the development and the ecosystem.
- Ensure and enhance safety within the development both within the construction and operation phases.
- Promoting environmental ethics within concerned parties and users.
- Ensure that social and environmental impacts, risks, and liabilities identified are effectively managed during the construction, operation, and closure of the proposed project.

These measures should be implemented under the following framework.

7.3.1 Land

- Ensuring vegetative cover on unpaved surfaces to maintain the integrity of soil structure within the project area.
- Minimizing soil compaction and excavation as much as possible during construction activities.
- Proper waste management (both solid and liquid) to avoid polluting the soil and unsightly environment.
- Paved areas to be made with porous materials to allow water to drain through.
- Adequate landscaping.
- Blending the structures in the existing scenery.
- Proper storm water drainage systems.
- Construction activities should be conducted in the dry season to minimize runoff.
- Avoid working wet soils susceptible to compaction and use of light machinery.

7.3.2 Biological diversity

- Creating vegetation and larger flora.
- Planting of more trees on site during and after the construction phase of the development.
- Creation and maintenance of a green buffer between the project and other land uses to mitigate microclimate modification.
- Ensuring that the construction site is kept clean and free from debris can reduce the likelihood of birds being attracted to the area. Discourage all nesting activities around the airport.

7.3.3 Air

- Maintaining low dust levels during construction through either surfacing the non- surfaced portion of the road or/ and water spraying regions not paved. This will reduce the amount of dust generated.
- Installation of scrubbers on the exhausts of emitting machinery.
- Erection of screens and buffer fences (noise barriers) to reduce the amount of dust and noise generated during construction reaching neighboring utilities.
- Use of noise absorbent padding in fixed plant installations.
- Use of ear- muffs by employees to reduce any exposure from noise.
- Sensitize adjacent communities on likely vibrations and increased noise from project activities.
- Retain and continue planting green- belts to create barriers between source and receiver, this strategy is a long-term measure as trees take a long time to be effective in creating noise barriers.
- Flower bushes and shrubs can be planted around noise emitting utilities.

7.3.4 Water

- Ensure conservation of water in the construction and operation phases through wise and only necessary use as well as recycling where applicable and appropriate.
- Management of any liquid and solid waste to ensure that they do not contaminate the surface water in the stream and the underground waters.
- Employing water catchments measures such as roof catchments where water harvested this way can be used for cleaning or lawn maintenance purposes.

- Maintaining vegetative cover within the non-paved area to reduce direct surface evaporation and enhance stream recharge.
- Ensure stormwater drains are adequately designed to mitigate stormwater runoff both during construction activities, as well as during operations.

7.3.5 Hazards and soil maintenance

Hazards, especially from the use of machinery, in and out of the site could be handled in several ways.

- Erecting hazards warning signs.
- Using smaller trucks that make narrow turnings.
- Constructing storm water drains to channel flood waters.
- Keep the percentage of area of impervious surface as low as possible to reduce runoff during storm periods.
- A spill management plan should be developed to address measures to prevent and mitigate the spillage of hazardous materials both during construction and operation of the project.

Hazards from the storing and handling of hazardous materials within the hangar could be handled in the following ways.

- Providing appropriate storage containers.
- Labeling materials properly.
- Having a plan in place for responding to spills or other emergencies
- Workers should receive appropriate training and protective equipment to minimize their exposure to hazardous materials.
- Implement sustainable waste management practices, such as reducing waste generation, recycling, and reusing materials where possible, and properly disposing of hazardous waste.

7.3.6 Climate

- Paved areas and concrete structures will reflect heat hence climate modification. Mitigation mainly involves landscaping of the area to reduce heat reflection and planting indigenous plant species.
- Fencing where applied should as much as possible be retained to chain-link and live fencing to reduce the surface area of built environment and to improve on the general aesthetics of the area.
- Local sourcing of construction materials will be prioritized to minimize carbon footprint and Co2 emissions.
- Sustainable building materials should be used to reduce emissions associated with their production, transportation, and disposal.
- The use of electric cars and pedestrian-friendly paving will be promoted for non-motorized mobility within the project facilities.

7.3.7 Health and safety

- Traffic signage and scheduling heavy-duty vehicle traffic in off peak hours.
- Provide appropriate Personal protective equipment (PPE) to all workers.
- Construction sites shall be provided with barricades to protect neighbors and those passing-by.
- Ensure workers are trained in workplace risks and how to handle them.
- Carry out proper waste management both during construction and operations to maintain cleanliness and proper hygiene on site.
- Access to areas containing exposed electrical equipment (such as transformers) shall be fenced and locked. Warning signs shall be posted at hazardous locations.

- Workers handling electricity and related components will be provided with shock resistant gloves, shoes, and other protective gears.
- Install overhead cables with proper insulation to avoid bat and bird electrocution.
- Regularly conduct fire risk assessments and strictly adhere to the established regulations and safety best practices.
- Regular inspections and proper maintenance completed by qualified personnel are important to ensure fire safety.
- The proponent should ensure proper training, safety equipment, and risk assessments as well as regular safety inspections to minimize health and safety risks.
- Develop and implement site-specific occupational health and safety (OH&S) Plan both during operations and construction.

7.4 Emergency Response Plan

Annex 2 describes the Emergency Response Plan (ERP) which will be instituted throughout the project cycle. The emergency response plan outlines the procedures and actions to be taken in case of an emergency, such as an aircraft accident, bomb threat, hijacking, or other critical incidents that can occur at an airport. This plan will maximize safety for Aviation Unit members, minimize Akagera aviation ltd losses due to aircraft damage and give guidance to critical agency members responding to leaders who do not have aviation backgrounds.

Table 15: Environmental and Social Management Plan (ESMP)

Impacts	Mitigation measures	Monitoring indicators	Timeframe/ occurrence	Responsibility	Cost (Rwf)/ Year
Biodiversity loss	<ul style="list-style-type: none"> Minimize the removal of vegetative cover, Felling the least number of trees as possible. Design the buildings and plan around existing trees with minimum vegetation removal. Adopt conservation measures (e.g., providing appropriate habitats). Undertake compensatory planting using native species from the area and based on Rwandan law. Indigenous tree species found on site and not earmarked for rescue should be introduced in the parts of the site that are planned for softscape establishments. Maintaining vegetation planted for landscaping and for aesthetic appeal. Plants and trees will be specified that are native to the local climate. Identify and replant the protected species. Clear vegetation in phases so that only those areas required for immediate development are cleared. Maintain grass vegetation cover. Carry out proper waste and stormwater management. 	<ul style="list-style-type: none"> Vegetative cover on site. Conservation measures in place. Re-vegetated areas. Adequacy of waste and stormwater management. 	Construction phase	Project manager, developer, contractor, REMA, Site supervisor, Kicukiro district	4,000,000
Soil erosion and compaction	<ul style="list-style-type: none"> Installing and maintaining erosion control measures such as silt fences, sediment basins and erosion blankets. Limit the amount of land that is disturbed and minimize the duration and intensity of soil disturbance. 	<ul style="list-style-type: none"> Erosion control measures Cleared areas. Soil management practices in use 	Construction phase	Project manager, developer, contractor, REMA, Site supervisor, Kicukiro district	<p>Included in the project cost.</p> <p>Good practice.</p>

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	<ul style="list-style-type: none">▪ Utilize lighter equipment, reduce the number of passes made on the soil, and avoiding working on wet soil conditions.▪ Regularly monitor erosion control measures.▪ Stockpile and replace the removed topsoil.▪ Maintain vegetation cover during and after construction to help prevent erosion.▪ Use of appropriate soil management practices, such as adding organic matter.▪ Stabilize slopes with appropriate retaining structures.▪ All soil and subsoil stored onsite will be mounded or lightly seeded.	<ul style="list-style-type: none">▪ Soil stabilizing structures			
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Increased runoff and stormwater management	<ul style="list-style-type: none"> ▪ Soils and subsoil stored separately to allow for potential reuse onsite or offsite. ▪ All soil and subsoil stored onsite will be mounded to reduce wind erosion or lightly seeded to aid stability thus preventing dust from arising. ▪ Installation of silt fencing. ▪ Installation of retention ponds and sediment traps. ▪ Regular maintenance and inspection of the stormwater management features. ▪ Ensure proper functioning of stormwater management features. ▪ Adhering to proper stormwater management practices. ▪ Use of appropriate drainage system and storm water management system. ▪ Provide inspection chambers to allow for inspection and smooth flow of water into public sewers. ▪ Ensure harvest and store water for gardening and cleaning purposes. ▪ Provision of appropriate gutters that channel the water into downspouts to the underground tank. ▪ Ensure adequate and correctly constructed storm drains. ▪ Stabilize slopes with appropriate retaining walls. 	<ul style="list-style-type: none"> ▪ Storage and handling of soil on site. ▪ Silt fencing ▪ Retention ponds and silt traps installed. ▪ Stormwater management and drainage systems. ▪ Rainwater harvesting ▪ Adequacy of the retaining walls. 	Construction and operation phases.	Project manager, contractor, REMA, Kicukiro district	Included in the project investment cost
Occupational Health and Safety	<ul style="list-style-type: none"> ▪ Develop and implement site-specific occupational health and safety (OH&S) Plan. ▪ Ensure that a qualified first aider is always present. ▪ Equipped first-aid stations shall be easily accessible throughout the site. ▪ Ensure provision of medical insurance coverage for workers. 	<ul style="list-style-type: none"> ▪ OHS plan. ▪ Qualified first aider and first aid stations. ▪ Medical insurance coverage. ▪ Welfare facilities 	Construction, and decommissioning phases	Developer, contractor, REMA, Kicukiro district, Site supervisor	7,000,000

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	<ul style="list-style-type: none"> ▪ Secure all installations from unauthorized intrusion and accident risks. ▪ Provide supplies of potable drinking water. ▪ Provide clean eating areas. ▪ Provide H&S orientation training to all new workers. ▪ Ensure that visitors do not enter hazard areas unescorted. ▪ Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas. ▪ Ensure moving equipment is outfitted with audible back-up alarms. ▪ Mark and provide sign boards for hazardous areas. ▪ Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day. ▪ Enforce actively the use of hearing protection. ▪ Provide fall protection systems and personal protective equipment. ▪ Implement ergonomic controls such as proper workstations, equipment, and tools. ▪ Provide scaffolding to cater for construction work at high levels. ▪ Block the high-level working areas. 	<ul style="list-style-type: none"> ▪ H&S orientation trainings ▪ Marks and sign boards ▪ PPE provided. ▪ Scaffolding 			
Employment-labor issues	<ul style="list-style-type: none"> ▪ Hire local, skilled, and unskilled labor as much as possible. ▪ Contracts for employees should have clauses that are in line with national labor laws. ▪ Every worker should also sign a code of conduct (CoC). 	<ul style="list-style-type: none"> ▪ Local labor hired. ▪ Compliance with labor laws. ▪ Grievance mechanisms. 	Construction, operation, and decommissioning phases.	Project manager, Developer, contractor, Kicukiro district	0 ⁵⁸

⁵⁸ Zero cost. It is a matter of following instruction given as the mitigation measure.

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	<ul style="list-style-type: none">▪ Facilitate workers to form a committee through which their grievances will be received attended to.▪ Ensure that workers are aware that their contract is temporary.▪ Provide trainings on how to start up and operate small scale-business activities from earnings.	<ul style="list-style-type: none">▪ Training provided by the developer.			
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Impacts of worker-community interactions	<ul style="list-style-type: none"> Engagement with the local community early in the project planning process. Establish clear communication channels with the local community. Provide workers with training in cultural sensitivity. Hire local workers as much as possible. Develop and enforce a code of conduct for workers that outlines expected behavior and interactions with the local community, as well as establish a Ensure mechanism for resolving conflicts between workers and the local community. Implement safety measures, such as traffic controls. Carry out screening of the labor force prior to project works. 	<ul style="list-style-type: none"> Engagement with the local community Training on cultural sensitivity Local-labor hiring Worker code of conduct Safety measures in place 	Operation phase.	Developer, Project manager, REMA, Kicukiro district	0 ⁵⁹
Impact on heritage	<ul style="list-style-type: none"> Implement chance find procedures where necessary. Repair and restore any damages to physical-cultural resources. Ensure that measures for minimizing noise pollution and traffic congestion are adhered to. Avoid interrupting cemetery while carrying out project activities. 	<ul style="list-style-type: none"> Damages to cultural resources. Measures in place to reduce noise and traffic jams. Interruption to the cemetery. 	Construction phases.	Project manager, developer, contractor, Kicukiro district	Good practice

⁵⁹ Zero cost. It is a matter of following instruction given as the mitigation measure.

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<p>Damage to the utilities in the area</p>	<ul style="list-style-type: none"> ▪ Ensure the survey of the area is conducted to identify the location of underground utilities. ▪ Notify and coordinate with the relevant utility companies about the construction project. ▪ Ensure the use of protective measures such as shoring, fencing, and barriers. ▪ Ensure the use of vibration monitoring equipment. ▪ Clean up of the construction site properly at the end of each workday. ▪ Establish the use of detection tools before excavating the area. ▪ Ensure scanning and marked-up of the site by trained people using reliable location tools. 	<ul style="list-style-type: none"> ▪ Protective measures in place ▪ Vibration monitoring equipment in use ▪ Marked-up sites. 	<p>Construction phases</p>	<p>Contractor, Project Engineer, Kicukiro District and REMA</p>	<p>Included in the project cost</p>
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<p>Noise Pollution</p>	<ul style="list-style-type: none"> ▪ Scheduled construction activities during off-peak hours. ▪ Avoid unnecessary use of vehicles' horns, playing loud music, and sudden braking or acceleration. ▪ Ensure the use of noise-reducing technologies such as low-noise equipment and machinery. ▪ Minimal rock blasting with pneumatic pressure drills. ▪ Surround the area with aluminum sheets and screen meshes. ▪ Heavy machinery and vehicles should be in good condition and emitting low noise levels. ▪ Contractors must make sure that suppliers' vehicles have a valid vehicle technical control certificate. ▪ Use of appropriate protective equipment (PPE) such as ear protectors. ▪ Check the performance of the major equipment periodically, to troubleshoot and fix the problem by lubricating, repairing, etc., ▪ Carry out regular sound level checks. ▪ Avoid queuing vehicles on the access road. ▪ The equipment should be designed to limit noise to 39 decibels (A). ▪ Regular maintenance and repair of equipment. ▪ Undertake activities with minimal heavy machinery. ▪ Workers near this equipment would be required to use hearing protection. ▪ Implement noise abatement procedures such as restrictions on flight training activities during certain hours or limiting the use of certain types of aircraft. 	<ul style="list-style-type: none"> ▪ Buffer screens installed. ▪ Usage of PPE such as ear mufflers. ▪ Scheduling of noisy activities ▪ Low-noise equipment in use ▪ Good working conditions of machinery and equipment. 	<p>Construction, and decommissioning phases.</p>	<p>Developer, RCAA, contractor, REMA, Kicukiro district, Site supervisor</p>	<p>5,700,000</p>
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	<ul style="list-style-type: none"> Conduct regular community engagement to address any concerns they may have. The design of the site makes use of the steep slope by incorporating the academic block in a manner that aligns with the topography. 				
Air Pollution	<ul style="list-style-type: none"> Vehicle speed limitations, particularly close to sensitive receptors (typically <20 km). Restriction on vehicular usage in off-road areas (e.g., tracking vehicles with GPS system). Managing dust during Major winds. Minimizing dust from material handling sources. Minimizing dust from open area sources. Enforce dust suppression techniques, such as applying water or non-toxic chemicals. Ensure the management of emissions from mobile sources. Establish rapid response as well as trained team to be mobilized in the event of spillage of hazardous materials. Optimize aircraft movements on the ground. Implement landing and take-off procedures that minimize emissions. Ensure efficient energy consumption where possible and maintained according to the manufacturers' recommendations. Ensure the use of jet fuel with the lowest possible Sulphur content. Regular vehicle maintenance with monitoring and enforcement of emission standards. Ensure the use of low-emission aircraft in the hangar and within academy practical training. Ensure regular maintenance checks of engines and equipment in order to run efficiently. Implement fuel spill prevention measures. 	<ul style="list-style-type: none"> De-dusting equipment Dust suppression techniques Efficient energy usage Response procedures in hazardous spill events. Working conditions of equipment. Spill prevention measures. General cleanliness of aircraft equipment, runway and surrounding areas. 	Construction, operation, and decommissioning phases	REMA, Kicukiro District, Akagera Aircraft, Contractor	20,000,000

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	<ul style="list-style-type: none"> Regularly monitor the air quality around the hangar and academy. Regular sweeping and cleaning of the runway and surrounding areas. Apply dust suppressants such as water or dust control agents on the runway and surrounding areas. Regular cleaning of aircraft engines. 				
Child Labor and Abuse	<ul style="list-style-type: none"> Ensure that the hired workforce is of an eligible age to work. Establish partnerships with relevant government agencies and NGOs to ensure children access survivor centered services. Workers should be educated by relevant agencies on the relevant laws and policies protecting children. Sexual exploitation and abuse of children should be promptly reported to the police. Enforce the child protection-related clauses in the Code of Conduct signed by all workers. Ensure visibility of signage and information, education, and communication materials on such issues. 	<ul style="list-style-type: none"> Age eligibility of the hired workforce. Child abuse survivor centered services. Reporting and addressing child abuse cases. Signage and information on child labor and abuse. 	Construction, operation, and decommissioning phases.	Project manager, Developer, contractor, Site supervisor, REMA, Kicukiro district	0 ⁶⁰
Gender related impacts	<ul style="list-style-type: none"> Enforce a comprehensive anti-sexual harassment policy. Enforce zero tolerance for any form of sexual harassment or gender-based violence in the workplace. Provide training on gender sensitivity, gender-based violence, and sexual harassment prevention. 	<ul style="list-style-type: none"> Equal employment opportunities. Separate accommodations and sanitary facilities. Programs for empowering women. 	Construction, operation, and decommissioning phases.	Project manager, Developer, contractor, Site supervisor, REMA, Kicukiro district	0 ⁶¹

⁶⁰ Zero cost. It is a matter of following instruction given as the mitigation measure.

⁶¹ Zero cost. It is a matter of following instruction given as the mitigation measure.

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	<ul style="list-style-type: none"> ▪ Ensure gender balance in the recruitment and hiring of construction workers. ▪ Provide equal opportunities for women to participate in all aspects of construction work. ▪ Promote the use of personal protective equipment (PPE) that is gender-sensitive and appropriate for both male and female workers. ▪ Regular monitoring and evaluation to identify and address any potential gender-related issues. ▪ The design has considered providing for separate accommodation facilities for both women and men. 	<ul style="list-style-type: none"> ▪ Trainings held on gender promotion and sensitivity. 			
Waste generation	<ul style="list-style-type: none"> ▪ Establish appropriate location for separation and temporary storage of general waste on site. ▪ Identify and segregate non-hazardous wastes for reuse and recycle with the local community. ▪ Ensure disposal of hazardous wastes to appropriate treatment facilities. ▪ Establishment of regular disposal to licensed third party landfill or recycling where possible. ▪ Always ensure that all waste storage units are covered. ▪ Ensure the spill kits are available. ▪ Ensure that the surroundings are kept clean. ▪ Ensure appropriate washing of trucks, equipment, and machinery. ▪ Clearly brief workers on proper disposal of solid waste. ▪ Post appropriate signage such as "DO NOT LITTER". ▪ All excavated spoils should be well managed. ▪ Clean up exercises will be regularly undertaken. ▪ Disposal areas should be clearly marked. 	<ul style="list-style-type: none"> ▪ Waste management plan ▪ Garbage bins provided. ▪ Allocated waste collection and storage areas. ▪ Waste reduction and recycling techniques. ▪ Handling and storage procedures. ▪ Waste segregation and labelling ▪ Spill kits available ▪ Cleanliness on site ▪ Wastewater treatment facilities ▪ Handling of excavated spoil 	Construction, operation and decommissioning phases.	Project manager, Developer, contractor, REMA, Kicukiro district	Included in the project cost

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	<ul style="list-style-type: none"> ▪ Ecosan toilets to be located within the construction area and offsite treatment recommended. ▪ A Waste Management Plan (WMP) for future monitoring and audits should be developed. ▪ Establish inventory control. ▪ Re-using materials on site wherever possible, specially to excavated materials. ▪ Ensure appropriate waste disposal site(s) for excavation material disposal. ▪ Waste reduction mechanisms should be employed on-site. ▪ Ensure the collection of garbage from the proposed project buildings before its decomposition. ▪ Ensure the implementation of a waste management handling procedure. ▪ Separate storage areas for hazardous and non-hazardous wastes should be organized in an appropriate way with special segregation and treatment for electronic wastes. ▪ As much as possible, practices that minimize waste are to be practiced and encouraged. ▪ Construct wastewater treatment plants for treating sewage during operations of the hangar and academy. ▪ Ensure that there are people responsible for the monitoring of efficient operations of the treatment plant. ▪ Ensure effective water treatment plant for wastewater recycling and treatment. ▪ The design should ensure wastewater treatment plants are placed to the lower parts of the sites to benefit the gravity. 				
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Accidental spills, leakage & discharge	<ul style="list-style-type: none"> ▪ Ensure that the employees on site are aware of the company Spill Prevention, Control and Countermeasure (SPCC) Plan. ▪ Install the dripping pans. ▪ Re-fueling in designated areas. ▪ Contaminated soil should be collected and treated. ▪ Appropriate materials handling and storage procedures. ▪ Development of contingency plans in the event of a spill. ▪ Spill kits should be readily available at all locations. ▪ Regularly monitor the environment for any signs of contamination, to quickly identify and address any potential issues. ▪ Develop and implement an emergency response plan. ▪ Oil interceptors and silt traps will be installed. ▪ Potential pollutants of any kind and in any form shall be adequately kept and stored. 	<ul style="list-style-type: none"> ▪ Spill Prevention, Control and Countermeasure (SPCC) Plan ▪ Dripping pans, oil interceptors, and silt traps installed ▪ Handling and storage procedures ▪ Spill kits available ▪ Emergency response and contingency plans 	<p>Construction, operation and decommissioning phase.</p>	<p>Developer, Contractor, site supervisor, REMA, Kicukiro district.</p>	<p>Included in the project cost</p>
Fire and Electrical hazards	<ul style="list-style-type: none"> ▪ Provide the workers with shock resistant gloves, shoes, and other protective gear. ▪ Provide adequate training regarding health and safety. ▪ Develop and implement a health, safety, and environment (HSE) management system. ▪ Fencing the areas containing exposed electrical equipment ▪ Ensure the posting of warning signs at hazardous locations. ▪ Ensure the use of non-combustible materials and insulation. ▪ Provide adequate personal protective equipment. 	<ul style="list-style-type: none"> ▪ PPE provided. ▪ H&S trainings ▪ HSE management system ▪ Erected warning signs ▪ Fire risk assessments ▪ Firefighting equipment ▪ Anti-static mats 	<p>Construction, operation, and decommissioning phases.</p>	<p>Project manager, Developer, RAC, contractor, REMA, Kicukiro district</p>	<p>5,000,000</p>

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	<ul style="list-style-type: none"> ▪ Ensure the installation of transmission cables underground in accordance with existing best practice guidelines. ▪ Ensure the installation of aboveground cables with proper insulation. ▪ Regularly conduct fire risk assessments. ▪ strictly adhere to the established regulations and safety best practices. ▪ Regular inspections. ▪ Ensure proper maintenance completed by qualified personnel. ▪ Provide firefighting equipment including fire extinguishers, hydrants, sand buckets, warning and detection system. ▪ The facilities should be outfitted with lighting protection and earthing equipment. ▪ Incorporate in design a central water cistern with pumping technology for firefighting. ▪ Provide anti-static mats. ▪ Ensure that workers wear wrist straps to prevent electrostatic discharge. 				
Increased energy consumption	<ul style="list-style-type: none"> ▪ Turn off equipment when not in use. ▪ Optimize equipment settings. ▪ Select energy-efficient temporary power systems that match the site's needs. ▪ Educate construction personnel on energy-saving practices. ▪ Optimize material choices and construction techniques. ▪ Efficient design of building's western façade. ▪ Provide adequate daylighting. ▪ Maintain proper lighting level. ▪ Encourage the use of energy efficient lifts and escalators. 	<ul style="list-style-type: none"> ▪ Energy usage on site ▪ Proper lighting level ▪ Efficient energy fixtures and systems present ▪ Solar panels 	Construction and operation phases.	Project manager, Developer, contractor, site supervisor, REMA Kicukiro district	Included in the project cost and best practice

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	<ul style="list-style-type: none"> Encourage the use of on-site renewable technologies. Encourage use of solar energy for water heating applications in buildings. Consider the use of an efficient air-conditioning system. Install solar panels on the roof. Use energy-efficient LED lighting and motion sensors for handwashing. 				
Increased water consumption	<ul style="list-style-type: none"> During construction, temporary cisterns may be built to capture rainwater. Design water systems with conservation in mind. Install water-conserving taps that turn off automatically when water is not being used. Provide water metering and pressure reducing valves. Recycle/reuse water at the establishment time where possible. Carry out rainwater harvesting. Carry out wastewater recycling and treatment. 	<ul style="list-style-type: none"> Temporary cisterns on site Recycling and re-use of water on site. Quality of recycled water. Water-conserving features Rainwater harvesting 	Construction and operation phases.	Project manager, Developer, contractor, site supervisor, REMA Kicukiro district	Included in the project cost and best practice
Insecurity	<ul style="list-style-type: none"> Ensure fencing active and inactive construction sites. Put in place an offense and penalty system. Informed community through appropriate public awareness programs. Provide adequate lighting for the construction sites. Closely monitored vehicular movement to prevent theft. Implement security scanning measures. Ensure the selection of security providers. Establish rules of engagement as well as train personnel. 	<ul style="list-style-type: none"> Site fencing Public awareness programs Security scanning and screening measures Trainings of personnel Security measures implemented. Emergency response plan 	Construction and operation phases.	RAC, RCAA, Akagera aviation LTD Project manager, contractor, Kicukiro district	7,000,000

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	<ul style="list-style-type: none"> ▪ Enhance efficient screening of personnel accessing the facilities. ▪ Implement security measures at all entrances and exits. ▪ Ensure strategic installation of security cameras within and around the project facilities. ▪ Trained security personnel should be present at various locations. ▪ Implement the emergency response plan. ▪ Adhere to the National Civil Aviation Security Program guidelines. ▪ Conduct regular patrols, checks, and surveillance. ▪ Provide adequate lighting for the project facilities. 				
Micro-climate modification	<ul style="list-style-type: none"> ▪ Identify areas with minimal movement and plant trees in those areas. ▪ Prioritize local sourcing of construction materials. ▪ Ensure the use of sustainable building materials. ▪ The entire project area should not be paved. ▪ Plant as many indigenous species as possible. ▪ Fencing should be retained to chain-link and live fencing. ▪ Promote the use of electric cars and pedestrian-friendly paving for mobility within the project facilities. ▪ Non-motorize the 1km road connecting the Hangar to the Academic block. ▪ Perform regular maintenance and cleaning of aircraft engines and components. 	<ul style="list-style-type: none"> ▪ Tree planting and landscaping activities ▪ Sustainable building materials and practices ▪ Chain-link and live fencing. ▪ Maintenance and cleaning of aircraft. 	Construction and operation phases.	Project manager, developer, contractor, REMA, Kicukiro district	Included in the project cost
Disturbance to the existing scenery	<ul style="list-style-type: none"> ▪ Ensure soil heaps and stockpiles adhere to size and duration restrictions. 	<ul style="list-style-type: none"> ▪ Fencing of the site ▪ Transportation of materials to the site 	Construction and operation phase	Project manager, developer,	800,000

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	<ul style="list-style-type: none"> ▪ Ensure that materials are transported to the site with minimal visual disturbance, preferably at night. ▪ The construction site should be fenced or hoarded off to prevent public view. ▪ Follow measures to minimize emissions. ▪ Conduct construction activities concurrently with landscape reinstatement processes. ▪ Ensure the use of selective shrub species for re-vegetation and reinstatement wherever possible. ▪ Manage lighting appropriately. ▪ Incorporate suitable green spaces in the design and retain key landscape features. ▪ Use trees, landscaping elements, walls, or fences to screen the hangar. ▪ Establish an effective balance between security and environmental sensitivity when designing light sources. ▪ The architectural design of the hangar should be a sympathetic low-rise building. ▪ Ensure the use of non-reflective surfaces and Sensitive and uniform coloration paint specifications of the facilities. ▪ Establish character that blends into the existing scenery. ▪ Limit the operating hours of the hangar and schedule training activities during less disruptive times to reduce visual impact. ▪ Ensure the proper engagement with local communities 	<ul style="list-style-type: none"> ▪ Revegetation practices ▪ Landscape reinstatement ▪ Engagement with the community 		contractor, REMA, Kicukiro district	
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Traffic Congestion	<ul style="list-style-type: none"> ▪ Install traffic signs limiting speed. ▪ Exit and entrance points should be well indicated. ▪ Provide temporary road signs or notices to indicate ongoing works. ▪ Sensitize project drivers on accident risk and control measures. ▪ Compensate victims of accidents. ▪ Materials hauling to tipping site and vice versa should be carried out during off peak periods. ▪ Develop a traffic management plan. ▪ Collaborate with the existing KIA Air Control Tower to prevent any air traffic that may. ▪ Conduct a thorough risk assessment. ▪ Provision of alternative access points to the academy training center. 	<ul style="list-style-type: none"> ▪ Implementation of the Traffic management plan. ▪ Installed traffic signage and notices. ▪ Number of accidents recorded 	Construction and decommissioning phases.	Developer, RCAA, RAC Project manager, contractor, Kicukiro district	Included in the project cost
Spread of Diseases	<ul style="list-style-type: none"> ▪ Workers should be educated to adhere to basic rules regarding protection of public health. ▪ HIV and AIDS and STIs prevention and response campaigns. ▪ Ensure the engagement of qualified professional safety staff. ▪ Develop a detailed, site-specific worker health and safety management plan. ▪ Cleaning up excessive waste debris. ▪ Ensure the use of specially trained personnel. ▪ Provide adequate sanitary facilities and maintain standard cleanliness. ▪ Provide a clinic and nursing room for the facilities. ▪ Ensure regular cleaning of the different areas in the facilities. ▪ Sensitize workers and surrounding communities on awareness, prevention, and management of HIV/AIDS. 	<ul style="list-style-type: none"> ▪ Health and safety management plan. ▪ HIV awareness and campaigns conducted. ▪ Clean-up practices ▪ Sanitary and waste management facilities ▪ Clinic and nurse rooms ▪ Partnerships with local wellness centers. 	Construction and decommissioning phases	Project manager, contractor, Kicukiro district, Site supervisor	3,200,000

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	<ul style="list-style-type: none"> ▪ Establish a partnership with local wellness centers. ▪ Undertake health screening of workers. ▪ Assist the nearby health facility in sensitization of employees involved in the project. ▪ Ensure proper sanitation and waste management practices. ▪ Ensure proper health education to minimize the risk. 				
Bird strike hazards	<ul style="list-style-type: none"> ▪ Ensuring that the construction site is kept clean and free from debris. ▪ Ensure the removal of food waste and other materials that could attract birds. ▪ Ensure perimeter fencing around the airport property. ▪ Monitoring and ensuring proper waste disposal. ▪ Engage contractors in waste management and disposal, grass cutting and bush clearing. ▪ Discourage all nesting activities. ▪ Workers should be trained to recognize and respond to bird strike hazards. ▪ Adhere to the existing KIA Wildlife hazard management. ▪ Removal of anthills, fumigation, and use of lights that do not attract insects. ▪ Use of covered containers, and protected disposal areas with wire mesh. ▪ Carry out vegetation management. ▪ Management of off-airport bird attractants within a 13km radius. ▪ Carry out bird scaring. ▪ Regularly carry out pest control and treat termite nests on the airfield. 	<ul style="list-style-type: none"> ▪ Cleanliness on site ▪ Adequate site fencing ▪ Nesting activities on site ▪ Training of workers on bird strike hazard response ▪ Vegetation management in place ▪ Pest control ▪ Bird scaring techniques 	Construction and operation phases	Akagera aviation Management, RAC, RCAA, REMA and Kicukiro District.	Included in the project cost and good practices.

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Community Health and Safety	<ul style="list-style-type: none"> ▪ Regularly communicate with the community to establish trust and encourage community participation in safety measures. ▪ Installing noise barriers such as berms, and vegetative barriers. ▪ Conducting training during non-peak hours. ▪ Regular maintenance of aircraft and ground support equipment. ▪ Develop a comprehensive risk management plan. ▪ Provide adequate training on emergency response procedures, including evacuation plans and fire safety. ▪ Use low-emission aircraft and ground support equipment. ▪ Minimize engine idling and ensure that fueling and maintenance operations are performed in compliance with environmental regulations. ▪ Establish guidelines for flight operations that minimize noise impacts. ▪ Encouraging the use of public transport or carpooling among staff and trainees. ▪ Develop and implement the emergency response plan. 	<ul style="list-style-type: none"> ▪ Noise barriers installed on site. ▪ Working conditions of aircraft and ground support equipment ▪ Emergency response procedures in place. ▪ Compliance of flight operation with the existing guidelines. ▪ Adequacy of the Emergency response plan. 	Operation phase	Project manager, developer, Kicukiro district.	Included in the project cost and good practice.
Storage and handling of hazardous materials	<ul style="list-style-type: none"> ▪ Implement and adhere to the KIA hazardous waste management plan. ▪ Ensure storage in appropriately secured, segregated, and labeled of Hazardous materials. ▪ Ensure the separation of hazardous waste into different categories. ▪ Implement sustainable waste management practices. ▪ Ensure the disposal of Hazardous waste in accordance with the existing regulations. 	<ul style="list-style-type: none"> ▪ Hazardous waste management plan ▪ Segregation, storage, labeling, handling, and disposal procedures ▪ Sustainable waste management practices implemented. 	Operation phase	Project manager, developer, contractor, REMA, Kicukiro district	Good practice

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	<ul style="list-style-type: none"> ▪ Carry out regular inspections and monitoring to detect leaks and other issues before they become significant problems. ▪ Establish spill prevention measures. ▪ Ensure regular environmental monitoring to identify potential impacts of hazardous waste storage and handling. ▪ Develop spill response plans. ▪ Provide regular personnel training on the risks and handling techniques associated with hazardous. ▪ Ensure the use of secondary containment methods. ▪ Ensure proper ventilation to prevent toxic fumes from hazardous waste buildup. ▪ Ensure that employees wear appropriate personal protective equipment to prevent exposure. ▪ Ensure the use of anti-static mats and humidifiers. 	<ul style="list-style-type: none"> ▪ Spill prevention procedures ▪ Spill response plan ▪ Trainings provided. ▪ PPE provided 			
Swimming pool safety	<ul style="list-style-type: none"> ▪ Outline the steps necessary to protect the health and safety of those using or operating the pool. ▪ Make available a list of contacts for emergency services such as emergency medical assistance, fire department, aquatic professionals, and police department. ▪ The swimming pool instructor should always be present. ▪ Summon emergency medical assistance and have qualified personnel administer cardiopulmonary resuscitation. ▪ Employ a security guard. ▪ Place barriers completely around the pool. ▪ Closely supervise the people in the pool and be prepared in case of emergency. 	<ul style="list-style-type: none"> ▪ Emergency medical assistance available on site ▪ Security guards ▪ Barriers around the pool ▪ Number of hours of the swimming pool teacher presence. ▪ Number of hours of security guard on site. 	Operation phase	Project manager, developer, REMA, Kicukiro district	Included in the project cost and good practices.

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		<ul style="list-style-type: none"> Number of accidents recorded at the pool. 			
Swimming pool water and chemicals evaporation	<ul style="list-style-type: none"> Install a pool cover. Keep the pool's cleaning equipment clean and lubricated. Switch the pool filter and sweeper operations to off-peak hours. Install a water-saving pool filter. Shorten the operating time for the swimming pool filter and use the automatic cleaning sweep. Create a windbreak around the pool with native plants and shrubs. Use "green" pool cleaning services, which involves filtering the pools contents and then pouring the water back in. 	<ul style="list-style-type: none"> Pool area covered (sqm). Pool's cleaning equipment cleaned and lubricated vs non-cleaned and non-lubricated. Water-saving pool filter. Areas covered by native plants and shrubs. 	Operation phase	Project manager, developer, REMA, Kicukiro district	Good practice
Swimming pool water quality	<ul style="list-style-type: none"> Regularly treat and clean the swimming pool water. Regular monitoring the swimming pool water quality. Check if the management meets the swimming pool water quality standards. Conduct regular testing of pool water parameters such. Maintain and clean the pool's filtration system. Maintain the recommended disinfectant levels. Remove debris from the pool regularly. Maintain and service pool equipment according to manufacturer guidelines. Provide guidelines and educate pool users on hygiene practices. 	<ul style="list-style-type: none"> Frequency of water cleaning and treatment Swimming pool water quality parameter values Adequacy of the filtration system. User guidelines provided. 	Operation phase	Project manager, developer, REMA, Kicukiro district	Good practice

7.5 Monitoring Framework

The ESMP for the proposed project is intended to establish a framework for applying mitigation measures for potential negative environmental consequences and to monitor the effectiveness of these mitigation measures based on pertinent environmental indicators. For implementation, supervision, and monitoring, the ESMP specified specific roles and duties for various stakeholders.

The objectives of the Environmental and Social Monitoring Plan (ESMoP) therefore are:

- To ensure that the recommendations in the approved ESIA report are adhered to by the various institutions.
- To ensure that the environmental and social mitigation and their enhancement actions are well understood and communicated to all involved stakeholders.
- To ensure that the proposed environmental and social remedial measures are implemented during the project execution stage.
- To evaluate the effectiveness of environmental and social remedial measures.
- To evaluate the effectiveness of various evaluation techniques and procedures.
- To provide the Proponent and the relevant Lead Agencies with a framework to confirm compliance with relevant laws and regulations.

Environmental monitoring, on the other hand, offers feedback regarding the project's actual environmental impacts. Monitoring outcomes enables evaluation of the effectiveness of environmental mitigating measures. Additionally, they are utilized to facilitate any necessary project design or operational changes, as well as to ensure compliance with environmental regulations and standards.

Over the course of the project, the environmental and social monitoring plan tackles both the project's building and operating phases. The developer will continue to be dedicated to the development and application of programs to lower the likelihood of damaging environmental incidents. Contingency plans will be developed for dealing with such incidents should they occur. The developer will require the same level of environmental performance from its agents, suppliers, and subcontractors and will stipulate this in any legally binding agreements with these parties.

To fulfil commitments with respect to managing the biophysical impacts of the project, the developer will have to designate a suitably qualified and experienced Environmental Manager. Personnel appointed by the project proponent on regular intervals and during the construction, will undertake regular monitoring of the project to examine any unanticipated impacts as well as the realization of the ESMP. It is recommended that monitoring be undertaken every month during the construction. REMA will continue monitoring the project during the use of the aviation hangar and academy training center facilities as is the case for other projects.

Monitoring to be undertaken will be both active and reactive.

Active monitoring will include the following:

- Monitoring of the achievements of Specific plans of the ESMP, performance criteria and fulfilment of objectives.
- Systematic inspection of workplace.
- Surveillance and monitoring of the work environment, including the organization of work and activities involved.
- Monitoring of workers' health.
- Monitoring compliance with laws, regulations, and other requirements.

Reactive monitoring will include the following:

- Work related injuries, ill health (including record keeping and monitoring of sickness/absence, disease, and Accidents.
- Losses such as damage to property.
- Deficient safety and health performance including OHSMS failures.
- Worker's rehabilitation and health restoration programs

The ESMP proposes parameters to be monitored during preparation, operation, and decommissioning of the Aircraft hangar and aviation training center project.

For each component, the following information should be presented in the plan:

The required mitigation measures recommended in ESIA.

- The person/organization directly responsible for adhering to or executing the required mitigation measures.
- The person/organization responsible for ensuring and monitoring adherence to mitigation measures.
- The parameters which will be monitored to ensure compliance with the mitigation measures; and
- A timescale for the implementation of the action to ensure that the objectives of mitigation are fully achieved.

The monitoring schedule below encompasses all the monitoring parameters, benchmark qualities and the data set to be used.

7.6 Environmental Management Measures

Although the potential for direct environmental effects is lower during the post-construction phase period than during the construction period, it is very important that environmental management continues, ensuring that all construction areas have been properly cleaned up and that any residual environmental impacts have been mitigated. This section deals with management measures to be employed during the post construction phase.

7.6.1 Site closure measures

Upon completion of construction of the Aircraft hangar and CoE aviation training center facilities, all construction detritus should be removed from the site and be disposed of at a designated landfill site. The site should be left in an acceptable state.

- Prior arrangements should be in place for reuse of some solid waste, including concrete, timber, glass and steel by contractors or other recipients. This is essential to reduce the potential of environmental contamination.
- Waste removed should be contained adequately in order to minimize spillage of materials and fugitive dust nuisance.
- Structural steel waste products may be sold to scrap metal merchants.
- Heavy equipment and machinery should be removed from the site.
- Fuel drums and oil should be properly removed to prevent spillage of any form and be disposed of appropriately.
- Re-vegetation should commence immediately so as to prevent exposure of soil and possible erosion of exposed areas.

7.6.2 General Emergency Response Measures

The operation of the proposed development will involve workers who may become ill or have accidents. In addition, disasters such as, floods are real possibilities. The following measures should be implemented:

- Make prior arrangements with health care facilities such as a Health Centre in proximity to deal with any medical emergencies.
- The project management should coordinate with mutual aid organizations/agencies to deal with emergencies.

Furthermore, it is advisable to establish an emergency response plan that outlines the necessary steps and measures to be taken during unforeseen events, such as an airplane crash, bomb scare, hijacking, or other emergencies that may arise at an airport. The objective of this plan is to enhance the safety of Aviation Unit personnel, reduce the losses incurred by Akagera aviation ltd as a result of aircraft damage, and provide direction to emergency response team members who may lack aviation experience.

7.6.3 Monitoring of Sewage Treatment Plant

This section deals with monitoring plans for the operation phase.

The plan is to design and install a central wastewater treatment plant to treat the domestic wastewater from the proposed project facilities.

The following should be implemented:

- Undertake quarterly water quality monitoring exercises for one year to ensure that the development is not negatively impacting on the water quality of the area. The parameters that should be monitored are dissolved oxygen, nitrates, total suspended solids, phosphates, turbidity, faecal and total coliforms.
- It is recommended that both influent and effluent water quality be monitored on a quarterly basis. This information should be compiled and stored in a database by the person appointed by the developer and compared with RDB guidelines for compliance. Corrective action should be undertaken in the event of non-compliance. The recommended list of parameters and the point of sampling is summarized in the table below:

Table 16: List of Parameters to be monitored at the STP.

Influent	Effluent	Effluent water quality
BOD5 (mg/l)	BOD5 (mg/l)	< 20
TSS (mg/l)	TSS (mg/l)	< 30
NH4-N (mg/l)	NH4-N (mg/l)	< 10mg/l
COD (mg/l)	COD (mg/l)	< 125
pH	pH	6-9
Oil and grease	Oil and grease	15mg/l
Total chlorine residual	Total chlorine residual	7.5µ/l

Influent	Effluent	Effluent water quality
Faecal Coliform	Faecal Coliform	< 200 counts/100ml
E-coli	E-coli	< 400FTU/100ml

- Dissolved oxygen and pH levels should also be monitored on a monthly basis in all of the tanks. Any organization with the capability to conduct monitoring of the listed parameters should be used to perform this exercise. It is recommended that a report be given to RDB at the end of each monitoring exercise.
- Undertake daily assessment of the quantity of solid waste generated and keep records of its ultimate disposal. This is to ensure that the skips and bins do not become overfilled.

7.6.4 Description of the proposed wastewater treatment plant

7.6.4.1 Proposed System Design Concepts

The system will be installed on the area proposed for it, to take advantage of gravity, it has been positioned in the lower part of the site. The wastewater treatment plant will be based on the measurements of the waste stream to be treated in respect of hydraulic load suspended and dissolved organic material, and the applicable local effluent requirements.

Estimated capacity of the Airoxy proposed wastewater treatment plant.

The academy training center will be composed of Offices, rooms, lab, workshop, Classrooms, hostel rooms, staff quarter rooms.

The training facility at the academy is designed to accommodate 490 students and 98 staff members, making a total of 588 individuals. The hostel block has three levels, with each level comprising 20 rooms that can house two people each, bringing the total number of residents to approximately 120. In addition, there is a gym and staff quarters that have two levels with six rooms, making a total of about 20. Therefore, the total number of permanent residents is about 140, which is equivalent to 488 non-residents. When we divide the non-residents by four, we get 112 PE. Therefore, the total number of PE is equal to 252, which is the sum of 140 and 112.

Table 17: Basic calculations for the design of the project wastewater treatment plant

Inhabitants	Inflow rate		Required volumes		
	Q (m ³ /day)	BOD (kg/day)	Primary tank	Buffer	SBR tank
20	3	1.2	To be accurately calculated	To be accurately calculated	To be accurately calculated
60	9	3.6	7.4	4.3	6.3
76	11.3	4.5	9.2	5.4	7.8
100	15.0	6.0	12.3	7.2	10.4

250	37.5	15	To be accurately calculated	To be accurately calculated	To be accurately calculated
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Reference: The proposed systems are called the Airoxy, to be provided and installed by Eco-Protection, representing Eloy Company for which the headquarter is located in Belgium.

The Airoxy is equipped with level measurement sensors:

- High level.
- Low level.

Phase 1: Fill

The buffer volume of the reactor is gradually filled with wastewater.

Phase 2: React

In order to consume the pollution, the biomass requires dissolved oxygen. A blower supplies oxygen to the bacteria (about 3mgO₂ /L) via anti-clogging fine bubbles diffusers. A programmable automaton ensures proper management of the system and controls phase sequence of the Airoxy cycles.

The aeration also provides a “spiral flow” stirring which mixes the SBR volume and increases oxygen transfer efficiency.

Phase 3: Settle

After the reaction period, solids are allowed to settle on the bottom of the tank and separate from the liquid under quiescent conditions. At the end of the settling period, a submerged pump circulates for a few minutes the clarified water. The circulation step helps to clean out pups, hoses, probes, and floating weirs. Afterwards, a three-way motorized valve switches position to allow the treated wastewater to exit the system.

Phase 4: Draw

Clarified treated wastewater may then be removed from the Airoxy and be discharged to the environment. Treated wastewater may be discharged in rain sewers, in rivers, polishing ponds, in filtration drains (depending on absorption capacity of the ground...), etc.

This is done by using pumps connected to floating weirs which steadily draw the clarified treated wastewater from the top. Depending on the topographic context, the pump could discharge the treated wastewater to a higher level.

Phase 5: Idle

After the draw phase, the Airoxy enters the idle phase and is ready to be refilled with wastewater.

7.6.4.2 Final Wastewater disposal

The clarified water will be discharged to the city storm drains. At the point of disposal, the water would be clear and free of offensive smells and more so compliant to the City Council and environmental agency standards. The design provides volume storage for treated water and as SFB showed interest, the treated water will be re-used within the premises. The necessary reticulation for re-use will be designed and quoted after detailed design.

7.6.4.3 Sludge disposal

Sludges are thickened (dewatered) to reduce the volumes transported off-site for disposal. There is no process which completely eliminates the need to dispose of biosolids.

Although the proposed WWTP technology may minimize sludge production and produce a sludge that is easier to process, the sludges accumulated in the proposed wastewater treatment process must normally be treated and disposed of in a safe and effective manner.

Rwanda has not adopted yet economical and legal instruments fostering sludge recycling, land filling, incineration and composting as regard to final disposal of wastewater sludges. Facilities for sludge treatment are non-existent. Therefore, the sludge will be removed at an estimated time frame of one year and when necessary, then sent to a site chosen and approved by Nyarugenge district for sludge disposal.

7.6.4.4 Quality Output

The system will achieve a minimum of the following standards:

- BOD <20mg/l
- TSS < 30 mg/l
- COD < 125mg/l
- Faecal count < 200 counts/100ml

In addition, the systems achieve a very good level of nitrogen reduction (<10mg/l).

7.6.4.5 Advantages of Airoxy system

- Cheaper.
- Efficient treatment system 96% (BOD, COD, NH₄⁺, TSS);
- High quality at discharge.
- Simple and low-cost maintenance.
- No need to add chemicals.
- Easy integration, the systems are underground with positive impact to environment.
- No errors.
- Long period to remove the accumulated sludge.
- A compact system.
- The chief advantage with aerobic systems is that increasing the rate of oxygen supplied can accelerate the rate of treatment processes.

The design is to be guided by the discharge limits provided by the Rwanda Bureau of Standards but not yet published, as follows:

- | | |
|-------------------------------|-------------|
| ▪ BOD | 20mg/l |
| ▪ Total dissolved solid (TSS) | 50mg/l |
| ▪ Faecal coliforms | 2 counts/ml |

The plants will be constructed of masonry or concrete construction partitioned to create the various chambers. Masonry or concrete provides a long-life facility as compared to plastic material. Besides, the scheme is more compacted and can take vehicular traffic over the top slab. Concrete/masonry construction would be preferred because it's easier to manage.

7.7 Institutional Arrangements in Implementing the ESMP

The main responsible institution for carrying out the proposed mitigation measures as well as the monitoring activities/measures associated with this mitigation plan will continue to be the contractor company that will be awarded the contract to construct the aircraft hangar and aviation training centre and all other auxiliary structures. The other institutions mainly Akagera aviation Ltd, RCAA, RAC, ATL, Kicukiro District, REMA...etc., will be solely involved in supporting the monitoring to ensure compliance. The mitigation measures that the contractors must implement throughout the construction phase to minimize negative effects should be clearly specified in the tender documents.

Table 18: Responsibility for EMP Implementation

Institution/ Origination	Role	How to perform the task/frequency
REMA	General Monitoring	<ul style="list-style-type: none"> Site visits EMP Review. Undertaking of annual environment audits
RDB	<ul style="list-style-type: none"> EIA report Review Environmental Certification 	<ul style="list-style-type: none"> Once during the Initiation of the Project
Project Developer	Routine Monitoring	<ul style="list-style-type: none"> Continuous Monitoring and undertaking of reviews of various targets. Provision of finances to implement the EMP
Kicukiro District	Routine Monitoring Issuance of Building and Operation Permits	Assess compliance with the EMP

Roles of Rwanda Environment Management Authority (REMA)

As the lead agency responsible for the protection of the environment in Rwanda, Rwanda Environment Management Authority (REMA) will play the leading oversight role in monitoring the activities of the project. According to the Cabinet decision establishing RDB and its functions, it has the responsibility to establish the conditions of conducting the ESIA, to review and approve the ESIA findings, conclusion, and recommendations through an EIA certificate. REMA at the other hand will contribute on the monitoring and enforcement of law and regulations. REMA will continue monitoring the project during the use of the Aircraft hangar and CoE aviation training centre facilities.

Roles of Akagera Aviation Ltd

Akagera Aviation Ltd is a subsidiary of ATL and operates from Kigali International Airport in Rwanda. It provides a range of aviation services including charter flights, cargo transportation, aerial surveys, and medical evacuations. Additionally, the company offers aircraft maintenance and pilot training services. The company owns a fleet of helicopters and fixed wing aircraft and has a team of experienced aviation professionals and pilots. The company is dedicated to delivering dependable, safe, and efficient aviation

services to its customers in Rwanda and nearby areas. It aims to build local capacity in the region by selecting qualified personnel.

The developer will remain committed to the creation and implementation of programs to reduce the probability of the occurrence of deleterious environmental incidents over the course of the project. Contingency plans will be developed for dealing with such incidents should they occur. The developer will require the same level of environmental performance from its agents, suppliers, and subcontractors and will stipulate this in any legally binding agreements with these parties.

In-order to fulfil its commitments with respect to managing the biophysical impacts of the project, the developer will have to designate a suitably qualified and experienced Environmental Manager. Personnel appointed by the project proponent on regular intervals and during the construction, will undertake regular monitoring of the project to examine any unanticipated impacts as well as the realization of the CESMP. It is recommended that monitoring be undertaken every month during the construction.

Role of the Contractor and Engineer

The contractor will take on the major responsibility of ensuring that the mitigation measures outlined in the ESMP are carried out in full. The contractors shall regularly monitor all activities taking place on the project site throughout construction and operation to ensure compliance with the ESMP. The expenses for monitoring operations during the construction and installation of the facilities will be covered by the contractors. The construction contractor(s) will be solely responsible for ensuring that monitoring and adherence to the ESMP beginning from the construction phase up to the point where they install and commission the proposed project facilities. Thereafter, their responsibility of project monitoring ceases.

The Engineer (consultant for supervision) will oversee the construction projects and make sure that EHS issues are managed in accordance with the CESMP that the contractor has prepared and approved. A full-time environment and social staff must be employed by the contractor and supervision consultant. The reporting procedure, who to report to, and how frequently will all be outlined by the Engineer. The Engineer will oversee the contractor, make sure the CESMP is implemented every day, and make sure monitoring reports are available and shared on a regular basis.

After the contractor turns over the project, Akagera Aviation Ltd will continue to be the sole institution with primary responsibility for the environmental, health, and safety monitoring. It will be expected to ensure monitoring throughout the project's operational phase.

Role of Communities

Although there are no actual settlements on the project sites or close by, there will be socio-economic displacement. It is critical that the local community benefits from the development and operation activities of the proposed project since those communities must support it. If such communities are involved in the project at every stage of development, the project can obtain maximum benefit. A brief handout summarizing the project and listing the people to contact before and during construction should be prepared and distributed by the implementing institution. Local communities should be encouraged to participate in the project implementation through temporary employment during construction of the aircraft hangar and aviation training center as well as operation activities.

Table 19: Environmental and Social Monitoring Plan (ESMoP)

Impacts	Monitoring indicators	Benchmark	Targets	Monitoring frequency
Biodiversity loss	<ul style="list-style-type: none"> ▪ Vegetative cover on site. ▪ Conservation measures in place. ▪ Re-vegetated areas. ▪ Adequacy of the waste and stormwater management. 	There is currently minimal to no loss of vegetation on site.	<ul style="list-style-type: none"> ▪ Appropriate landscaping of the site to maintain a vegetative cover. ▪ Maximize protection of integrity of the biodiversity on site. 	Continuous during construction.
Soil erosion and compaction	<ul style="list-style-type: none"> ▪ Erosion control measures ▪ Cleared areas. ▪ Soil management practices in use ▪ Soil stabilizing structures 	There are currently no erosion evident on site.	<ul style="list-style-type: none"> ▪ Minimizing soil erosion on site. ▪ Maintaining the soil integrity. 	Continuous during construction.
Increased runoff and stormwater	<ul style="list-style-type: none"> ▪ Storage and handling of soil on site. ▪ Silt fencing ▪ Retention ponds and silt traps installed. ▪ Stormwater management and drainage systems. ▪ Rainwater harvesting ▪ Adequacy of the retaining walls. 	There are no indications of runoff on site, given the vegetative cover present.	<ul style="list-style-type: none"> ▪ Minimizing runoff and soil erosion on site. ▪ Retaining as much stormwater as possible. ▪ Properly channeled stormwater drains. ▪ Maintaining the soil integrity. 	Continuous during construction and operation.
Occupational health and safety	<ul style="list-style-type: none"> ▪ OHS plan. ▪ Qualified first aider and first aid stations. ▪ Medical insurance coverage. 	Given that the hangar site is within the existing airport, there may be OHS related issues present within the airport.	<ul style="list-style-type: none"> ▪ Implementation of an effective OHS plan. ▪ Maximizing the welfare of workers. 	Continuous during construction.

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	<ul style="list-style-type: none"> Welfare facilities H&S orientation trainings Marks and sign boards PPE provided. Scaffolding 	However, there are currently none on the aviation academy site.		
Employment-labor issues	<ul style="list-style-type: none"> Local labor hired. Compliance with labor laws. Grievance mechanisms. Training provided by the developer. 	There are currently none, present on site.	<ul style="list-style-type: none"> Hiring priority should be local labor as much as possible. Carry out project activities in a manner that upholds labor rights. Compliance with labor laws and standards 	Continuous during construction.
Impact of worker-community interactions	<ul style="list-style-type: none"> Engagement with the local community Training on cultural sensitivity Local-labor hiring Worker code of conduct Safety measures in place 	There are currently none, present on site.	<ul style="list-style-type: none"> Hiring priority should be local labor as much as possible. Upholding the highest work ethics amongst workers. 	Continuous during construction.
Impact on heritage	<ul style="list-style-type: none"> Damages to cultural resources. Measures in place for reducing noise and traffic jams. Interruption to the cemetery. 	There is currently a cemetery close to the academy training center.	<ul style="list-style-type: none"> Conservation and preservation of any historical and cultural features encountered. 	Continuous during construction.
Damage to utilities in the area	<ul style="list-style-type: none"> Protective measures in place Vibration monitoring equipment in use 	Given that the hangar site is within the existing airport, there is presence of several utilities in the	<ul style="list-style-type: none"> Maintaining and protecting all present utilities on site as much as possible. 	Continuous during construction.

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	<ul style="list-style-type: none"> ▪ Marked-up sites. 	area, that may be at risk of damage.		
Noise pollution	<ul style="list-style-type: none"> ▪ Buffer screens installed. ▪ Usage of PPE such as ear mufflers. ▪ Scheduling of noisy activities ▪ Low-noise equipment in use ▪ Good working conditions of machinery and equipment. 	Noise nuisance is already present on site, from aircraft landing, takeoff, and maintenance operations.	<ul style="list-style-type: none"> ▪ Limiting noise emissions below the acceptable limits. ▪ Conducting all activities with minimal noise emissions. 	Continuous during construction and operations.
Air pollution	<ul style="list-style-type: none"> ▪ De-dusting equipment ▪ Dust suppression techniques ▪ Efficient energy usage ▪ Response procedures in hazardous spill events. ▪ Working conditions of equipment. ▪ Spill prevention measures. ▪ General cleanliness of aircraft equipment, runway and surrounding areas. 	There are currently no point sources of air emissions on both the hangar and academy sites, however emissions in the area are mainly from aircraft and vehicular movement around the airport.	<ul style="list-style-type: none"> ▪ Minimal emissions to the atmosphere from construction and operation activities ▪ Utmost suppression of dust ▪ Operating and maintaining machinery in the best conditions. 	Continuous during construction and operations.
Child-labor and abuse	<ul style="list-style-type: none"> ▪ Age eligibility of the hired workforce. ▪ Child abuse survivor centered services. 	There are currently no child labor and abuse cases.	<ul style="list-style-type: none"> ▪ Zero child labor and abuse cases. ▪ Promoting utmost child protection and rights in the 	Continuous during construction.

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	<ul style="list-style-type: none"> ▪ Reporting and addressing child abuse cases. ▪ Signage and information on child labor and abuse. 		surrounding community.	
Gender related impacts	<ul style="list-style-type: none"> ▪ Equal employment opportunities. ▪ Separate accommodations and sanitary facilities. ▪ Programs for empowering women. ▪ Trainings held on gender promotion and sensitivity. 	None yet on site	<ul style="list-style-type: none"> ▪ Ensure that women are given utmost employment opportunities and that there are empowerment programs. ▪ Zero cases of sexual harassment. ▪ Promote gender equality within the workplace. 	Continuous both during construction and operation.
Waste generation	<ul style="list-style-type: none"> ▪ Waste management plan ▪ Garbage bins provided. ▪ Allocated waste collection and storage areas. ▪ Waste reduction and recycling techniques. ▪ Handling and storage procedures. ▪ Waste segregation and labelling ▪ Spill kits available ▪ Cleanliness on site ▪ Wastewater treatment facilities 	<p>There are no waste streams present yet on the academy site.</p> <p>As for the hangar site, since it is within the KIA, there are already waste streams from the airport operations.</p>	<ul style="list-style-type: none"> ▪ Effective management of all waste generated on site. ▪ Recycling material as much as possible. ▪ Reducing waste generation as far as practical. ▪ Maintaining utmost cleanliness of the site. ▪ Effective implementation of the Waste management Plan. 	Continuous both during construction and operation.

Aircraft hangar and CoE aviation training center

ESIA

	<ul style="list-style-type: none"> ▪ Handling of excavated spoil. 			
Accidental leaks, spills, and discharges.	<ul style="list-style-type: none"> ▪ Spill Prevention, Control and Countermeasure (SPCC) Plan ▪ Dripping pans, oil interceptors, and silt traps installed ▪ Handling and storage procedures ▪ Spill kits available ▪ Emergency response and contingency plans. 	Accidental spills could be present at the existing apron, hangar, wastewater facilities, and other existing KIA facilities.	<ul style="list-style-type: none"> ▪ Effective handling and storage of materials. ▪ Effective containment of any spills and leaks. ▪ Rapid response to any incidences of spills and leaks. ▪ Utmost adherence to the SPCC plan. 	Every 3 months both during construction and operation.
Fire and electrical hazards	<ul style="list-style-type: none"> ▪ PPE provided. ▪ H&S trainings ▪ HSE management system ▪ Erected warning signs ▪ Fire risk assessments ▪ Firefighting equipment ▪ Anti-static mats 	Risks are present within the existing airport facilities mainly from existing transformer, existing hangar, electrical lines, equipment storage areas, and wiring.	<ul style="list-style-type: none"> ▪ Ensuring utmost safety from electrical and fire hazards throughout all phases. 	Every 3 months both during construction and operation.
Increased energy consumption	<ul style="list-style-type: none"> ▪ Energy usage on site ▪ Proper lighting level ▪ Efficient energy fixtures and systems present ▪ Solar panels 	Energy is currently consumed from airport operations, at the hangar site. As for the academy training center, there is currently no energy consumption present on site.	<ul style="list-style-type: none"> ▪ Maximize energy conservation on site. ▪ Optimize natural lighting and ventilation in buildings. 	Continuous during construction and operation.
Increased water consumption	<ul style="list-style-type: none"> ▪ Temporary cisterns on site ▪ Recycling and re-use of water on site. 	Water is currently consumed from airport operations, at the hangar site. As for the academy	<ul style="list-style-type: none"> ▪ Improved water and conservation. ▪ Zero wastages 	Continuous during construction and operation.

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ESIA

	<ul style="list-style-type: none"> ▪ Quality of recycled water. ▪ Water-conserving features ▪ Rainwater harvesting 	training center, there is currently no water consumption present on site.	<ul style="list-style-type: none"> ▪ Maximum recycling and reuse. ▪ Maximum water storage and roof catchment. 	
Insecurity	<ul style="list-style-type: none"> ▪ Site fencing ▪ Public awareness programs ▪ Security scanning and screening measures ▪ Trainings of personnel ▪ Security measures implemented. ▪ Emergency response plan 	The airport is a highly sensitive area. Therefore, security is highly enforced.	<ul style="list-style-type: none"> ▪ Maximizing security and site safety. ▪ Effective implementation of the Emergency response plan. ▪ Complying to the provisions of the National civil aviation security program. 	Continuous during construction and operation.
Micro-climate modification	<ul style="list-style-type: none"> ▪ Tree planting and landscaping activities ▪ Sustainable building materials and practices ▪ Chain-link and live fencing. ▪ Maintenance and cleaning of aircraft. 	Activities modifying the local climate are mainly from operating aircraft and paved areas at the airport.	<ul style="list-style-type: none"> ▪ Maximize vegetation in open areas. ▪ Maximize live fencing where applicable. ▪ Maximum use of green energy. ▪ Maximize use of substitute raw eco-friendly materials. 	Continuous.
Disturbance to the existing scenery	<ul style="list-style-type: none"> ▪ Fencing of the site ▪ Transportation of materials to the site ▪ Revegetation practices ▪ Landscape reinstatement ▪ Engagement with the community. 	The existing airport structures are the current structures affecting the visual quality and scenery of the area.	<ul style="list-style-type: none"> ▪ As much as possible, a green landscape should dominate the site. ▪ Project structures to wholly blend into the existing landscape. 	Continuous.

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ESIA

Traffic congestion	<ul style="list-style-type: none"> ▪ Implementation of the Traffic management plan. ▪ Installed traffic signage and notices. ▪ Number of accidents recorded 	Traffic congestion is present on the KN 5 road giving access to the airport.	<ul style="list-style-type: none"> ▪ Smooth traffic flow during within the area. ▪ Implementation of the traffic management plan 	Continuous both during construction and operation.
Spread of diseases	<ul style="list-style-type: none"> ▪ Health and safety management plan. ▪ HIV awareness and campaigns conducted. ▪ Clean-up practices ▪ Sanitary and waste management facilities ▪ Clinic and nurse rooms ▪ Partnerships with local wellness centers. 	None yet on site.	<ul style="list-style-type: none"> ▪ Conducting effective HIV awareness programs. ▪ Ensuring a health and sanitary workplace. 	Continuous during construction and every 3 months during operations.
Bird strike hazards	<ul style="list-style-type: none"> ▪ Cleanliness on site ▪ Adequate site fencing ▪ Nesting activities on site ▪ Training of workers on bird strike hazard response. ▪ Vegetation management in place ▪ Pest control ▪ Bird scaring techniques 	Bird strike risks are already present.	<ul style="list-style-type: none"> ▪ Minimizing incidences of bird strike. 	Every 3 months during operations.
Community Health and Safety	<ul style="list-style-type: none"> ▪ Noise barriers installed on site. ▪ Working conditions of aircraft and ground support equipment ▪ Emergency response procedures in place. 	Such risks can always be present for the existing KIA given the nature of operations of an airport.	<ul style="list-style-type: none"> ▪ Minimizing incidences of accidents and near-misses. ▪ Effective implementation of emergency response 	Continuous during operations.

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ESIA

	<ul style="list-style-type: none"> ▪ Compliance of flight operation with the existing guidelines. ▪ Adequacy of the Emergency response plan. 		<p>plans and procedures in place.</p> <ul style="list-style-type: none"> ▪ Utmost maintenance of aircraft and ground supporting equipment in good working conditions. 	
Storage and handling of hazardous materials	<ul style="list-style-type: none"> ▪ Hazardous waste management plan ▪ Segregation, storage, labeling, handling, and disposal procedures ▪ Sustainable waste management practices implemented. ▪ Spill prevention procedures ▪ Spill response plan ▪ Training provided. ▪ PPE provided 	Issues associated with handling and storage of hazardous materials are present mainly from the existing hangar at the airport.	<ul style="list-style-type: none"> ▪ Effective management of all hazardous waste generated. ▪ Adequate and prompt response to incidences of spills. ▪ Effective implementation of the hazardous management plan. 	Continuous during operations.
Swimming pool safety	<ul style="list-style-type: none"> ▪ Emergency medical assistance available on site ▪ Security guards ▪ Barriers around the pool ▪ Number of hours of the swimming pool teacher presence. ▪ Number of hours of security guard on site. ▪ Number of accidents recorded at the pool. 	None yet present on site.	<ul style="list-style-type: none"> ▪ Maximizing safety around the pool. 	Continuous during operations.

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Swimming pool water and chemicals evaporation	<ul style="list-style-type: none"> ▪ Pool area covered (sqm). ▪ Pool's cleaning equipment cleaned and lubricated vs non-cleaned and non-lubricated. ▪ Water-saving pool filter. ▪ Areas covered by native plants and shrubs. 	None yet present on site.	<ul style="list-style-type: none"> ▪ Totally covering the pool as much as possible. ▪ Minimizing water losses and accompanying costs, due to evaporation. ▪ Ensuring water is cleaned and up to the standards. 	Continuous during operations.
Swimming pool water quality	<ul style="list-style-type: none"> ▪ Frequency of water cleaning and treatment ▪ Swimming pool water quality parameter values ▪ Adequacy of the filtration system. ▪ User guidelines provided. 	None yet present on site.	<ul style="list-style-type: none"> ▪ Good frequency of water treatment and cleaning ▪ Water quality parameter values below the acceptable limits. 	Continuous during operations.

8.0 STAKEHOLDER ENGAGEMENT PLAN (SEP)

8.1 Introduction

Stakeholder engagement is the practice of interacting with and influencing project stakeholders to the overall benefit of the project and its advocates. These stakeholders are individuals, groups, and organizations whose interests may be affected by a proposed project. The successful completion of a project usually depends on how the stakeholders view it. Their requirements, expectations, perceptions, personal agendas, and concerns will influence the project, shape what success looks like, and impact the outcomes that can be achieved.

Successful stakeholder engagement is therefore a vital requirement for professional project management. It is now standard practice for the ESIA process to include information disclosure followed by consultations with stakeholders throughout the ESIA process and, also, during the post-approval construction and operation phases of a project.

This chapter includes a presentation of the stakeholder engagement elaborating information disclosure and consultation activities carried out for this ESIA Report. Issues and concerns collected were used to inform the project alternatives analysis, the mitigation and enhancement measures as well as recommendations of the ESMP.

The key objectives of the Stakeholder Engagement Plan are to:

- Identify key stakeholders that are affected, and/or able to influence the Project and its activities.
- Define roles and responsibilities for the implementation of the SEP and the reporting and monitoring measures to ensure the effectiveness of the SEP, and periodical reviews of the SEP based on findings.
- Understand the stakeholder engagement requirements of Rwandan legislation and provide guidance for meeting the standards of International Best Practice.
- Ensure that adequate and timely information is provided to stakeholders affected by the proposed project to ensure regular, accessible, transparent, and appropriate consultation.
- Provide stakeholders with sufficient opportunity to provide their opinions and comment upon the risks, impacts and opportunities posed by the proposed project.
- Ensure that stakeholder comments are received in a timely manner so that they can be considered in both the ESIA process and proposed project decisions.
- Establish formal grievance/resolution mechanisms.

The stakeholder engagement undertaken for this ESIA process, was designed compliant with national EIA guidelines and AfDB Operational Safeguard 1 which recognizes the importance of open and transparent engagement between the borrower and project stakeholders as an essential element of good international practice; therefore, its implementation, recording of consultation outcomes and provision of feedback to stakeholders, regarding their concerns/impact issues, are believed to meet all Lender requirements.

The approach undertaken for information disclosure and consultation at the ESIA stage involved the following key processes.

- Mapping and identification of key stakeholders such as primary and secondary and prioritizing them according to their influence.
- Conducting expert consultations, informal interviews, and Key Informant Interviews.
- Assessing the influence and impact of the project on these stakeholder groups and vice versa, and
- Summing up of key findings and observations from the consultations.

The overall goal of the consultation process was to disseminate project information and to incorporate the views of the stakeholders and communities living close to the site in the design of the Environmental and Social management Plan. The specific aims of the consultation process are to:

- Inform the public and all stakeholders of the details of the proposed aircraft hangar and aviation training center project.
- Provide clear and accurate information about the project to the development neighbors.
- Obtain the main concerns and perceptions of the population and their representatives regarding the project.
- Obtain opinions and suggestions directly from the affected people and their preferred mitigation measures.
- Collect views on the positive and negative impacts anticipated by stakeholders and how these can be overcome.
- Improve project design and thereby minimize potential impacts; and
- Reduce problems of institutional coordination.

8.2 Stakeholder identification and consultation process

Stakeholder identification process was conducted at an early stage to make sure stakeholders are consulted in order to understand their needs and expectations for engagement, and their priorities and objectives in relation to the proposed project. This information was used to tailor engagement to each type of stakeholder. As part of this process, it is particularly important to identify individuals and groups who may find it more difficult to participate and those who may be differentially or disproportionately affected by the proposed project because of their marginalized or vulnerable status.

There are a variety of engagement techniques used to build relationships with stakeholders, gather information from stakeholders, consult with stakeholders, and disseminate project information to stakeholders. When selecting an appropriate consultation technique, culturally appropriate consultation methods, and the purpose for engaging with a stakeholder group should be considered. The techniques mostly used are tabulated below:

Table 20: SEP techniques

Engagement Technique	Appropriate application of the technique
Correspondences (Phone, Emails, Text, instant messaging)	Distribute information to Government officials, NGOs, Local Government, and organizations/agencies Invite stakeholders to meetings and follow-up
One-on-one meetings	Seeking views and opinions Enable stakeholder to speak freely about sensitive issues Build personal relationships Record meetings
Formal meetings	Present the Project information to a group of stakeholders Allow group to comment – opinions and views Build impersonal relation with high level stakeholders Disseminate technical information Record discussions
Public meetings	Present Project information to a large group of stakeholders, especially communities Allow the group to provide their views and opinions Build relationship with the communities, especially those impacted Distribute non-technical information Facilitate

	meetings with presentations, PowerPoint, posters etc. Record discussions, comments, questions.
Focus group meetings	Present Project information to a group of stakeholders Allow stakeholders to provide their views on targeted baseline information Build relationships with communities Record responses
Project on website/Information Centre/information Boards	Establish Information Board in each project area Present project information and progress updates Disclose ESIA, ESMP and other relevant project documentation
Direct communication with affected crops/asset/goods/landowners	Share information on timing of project activities Agree on options for removing crops and relocation of properties
Radio/TV emissions	Arrange for broadcast Radio/TV emissions to bring the project to large public awareness and allow question/answer session
Project information on site	Share information on project activities Provide information on construction materials that will be needed to incite potential suppliers
Project leaflet	Brief project information to provide regular update Site specific project information
Workshops	Present project information to a group of stakeholders Allow stakeholders to provide opinions and views. Use participatory exercises to facilitate discussions, brainstorm issues, analyze information and develop recommendations and strategies
Focus group meetings	Allow small groups of people (women, youth, vulnerable people, disabled people, etc.) to provide their views and opinions Build relationship with neighboring communities Use a focus group interview guideline to facilitate discussions Response recording
Surveys	Gather opinions and views from individual stakeholders Gather baseline data Record data Develop a baseline database for monitoring impacts

In order to engage with stakeholders for the Aircraft hangar and CoE aviation training center project, a variety of consultation techniques were employed. These techniques included correspondences, one-on-one meetings, formal meetings, and public meetings. Through these methods, the project team was able to communicate with stakeholders and receive their inputs and feedback. The correspondence method involved communication through phone calls, letters, and emails, while one-on-one meetings allowed for individual discussions with stakeholders. Formal meetings were organized with a specific agenda and attendance list, and public meetings were held to involve a larger audience and share information about the project with the wider community. Overall, these consultation techniques were used to facilitate a productive and inclusive stakeholder engagement process for the aviation hangar and academy training center project.

8.3 Methodology employed for Stakeholder Engagement for the EIA process.

Public consultations and engagement forums involved disclosing information on the proposed project and the anticipated potential impacts, both negative and positive. The stakeholders were engaged to establish their view on the proposed project. Several consultations were conducted during this phase of ESIA preparation. A combination of methods of information disclosure and consultation process were adopted at this stage. The method selected for consultation was adopted keeping in mind the profile of the stakeholders, type of information desired and level of engagement required.

The methodology employed for Stakeholder Engagement for the ESIA process of the aviation hangar and academy training center project included:

- Correspondence (Phone, Emails, Text, instant messaging) for distributing information to Government officials, NGOs, Local Government, and organizations/agencies, inviting stakeholders to meetings and follow-up.
- Public meeting to present project information to a large group of stakeholders, especially communities, allowing the group to provide their views and opinions.
- Formal meetings to present the project information to a group of stakeholders, allow group to comment opinions and views, build impersonal relation with high level stakeholders, and disseminate technical information.

The identified stakeholders can be grouped as follows:

- Affected communities (residents of Nyarugunga sector)
- The developer: Akagera Aviation Ltd
- Contractor and sub-contractors.
- Local authorities (district, sector, and cell officials of Kicukiro district, Kigali city)
- Government Institutions (MINALOC, MININFRA, MoE, MIGEPROF, RDB, REMA, RURA, RSB, REG, RCAA, WASAC, ATL, RAC, RwandAir, Rwanda Air Force, Rwanda National Police etc.,)
- Donor: AfDB
- Local companies and NGOs.

8.4 Stakeholder Engagement during the ESIA process

As required by the guidelines, EIA incorporates interests of public and private stakeholders, residents and communities in the planning and approval process of projects. At least two stakeholder consultations are conducted during the ESIA process both at an early stage of the study and throughout the process. This allows for discussions on view and opinions of stakeholders to be incorporated and considered during the design and implementation of the project.

During the ESIA process for aviation hangar and academy training center Project, stakeholder engagement was undertaken with a range of meetings; Public consultations with communities living in the vicinity of the area and formal meetings with high level stakeholders. Public participation and community consultation have been taken up as an integral part of social assessment process of the project. Consultation was used to inform stakeholders and collect their views and concerns about the proposed action both before and after the development decisions were made.

8.4.1 Stakeholders at local level

Involving stakeholders through participatory direct or indirect consultations is central to completion of the ESIA. The stakeholders were those who have an interest in the project, and who will be involved in the further consultative process. The stakeholders identified included local authorities and the community in the Nyarugunga sector. These groups were consulted to gather their perspectives and opinions on the potential environmental and social impacts of the project, and to identify any potential mitigation

measures. Engaging with stakeholders in this manner helps to ensure that the concerns and needs of affected communities are considered in the decision-making process and helps to foster a sense of ownership and participation in the project's outcomes.

Administration of the Public participation

In January 2023, a team conducted a site visit to the proposed aviation hangar and academy training center project site located in Nyarugunga sector. As part of the public consultation process, the team engaged with the local community within a radius of approximately 1km from the site to gather their feedback and opinions on the project.

The primary focus during the public consultation process was on the residents who would be directly affected by the aviation hangar and academy training center project in Nyarugunga sector. The team collected their names and contact information to ensure further engagement with them. All the feedback and opinions shared during this consultation were documented and included in the project report that was submitted to RDB for review.

It is key to understand the importance of community involvement and the significance of the public opinions and perspectives in shaping the project's development. The stakeholder engagement with the community will be a continuous process throughout the project construction and operation phases, to keep the community informed and engaged throughout the process so that their concerns and views are taken into consideration.

Table 21: Participants in the public consultation

Attendants	Number of participants
Women	9
Men	19

Summary of anticipated negative and positive impacts

Participants in the consultation identified a number of environmental and social impacts both positive and negative to be caused by the activities of construction of aviation hangar and academy training center project.

As much as stakeholders (participants in the meeting) appreciated and welcomed the Project, they expressed concern on a number of issues associated with the Project. Below are some of the most emerging issues raised and discussed during consultation:

Positive Issues

Employment opportunities

The proposed development aviation hangar and academy training center will consist of construction of staff meeting room, offices and maintenance aircraft hangar as well as academy facilities that will require skilled and non-skilled staff during the construction and operational phases. The respondents were keen to state on the jobs that will be created from the project.

Business Opportunities

The respondents stated that the business opportunities will increase in two diverse ways:

The construction phase: The contractors will need various materials, machines and equipment that need to be supplied from various businesses. The local businesses will be greatly improved due to the high demand of materials that will be needed.

Operational phase: The influx of people likely to occur because of the proposed project will mean that there will be a need for subsidiary services. Also, the prices of land will increase due to the forces of demand and supply making the local landowners to capitalize on the investment hub that will be created from the proposed development.

Increase in security.

The respondents complemented the proposed project in terms of increase in security around the area during operational and construction stages. There will be security guards who will safeguard the materials, machines and equipment during the construction phase and also protect the residents near the site during the operation phase. The project components will be highly equipped with CCTV (Close Circuit Television) to offer 24-hour security to the site.

Negative Issues

Increase in traffic and congestion of the road.

The proposed project is located along Kanombe Road and Busanza road that is a two - local freeway. This means that influx of people in the area will likely cause traffic jams and congestion. The proposed project will host many visitors, clients who are likely to have vehicles that are parked in the proposed parking making congestion of roads a likely occurrence.

Stress on sewage system

The residents were concerned about the measures that will be taken to manage the waste and waste management system. The proposed project will mean that human waste and aircraft hangar waste will increase due to maintenance and offices activities. The developer will ensure that there is an integrated waste management system. This entails structured waste collection points (dustbins), regular waste collection, connection of the sewage system to the Kigali sewage network and regular environmental audit. The developer (AKAGERA Aviation Limited) is keen on ensuring a sustainable environment especially to the tenants and the local people.

Noise and Vibrations

The neighbors adjacent to the project site raised the issue of noise that is likely to occur when the project is commenced. The construction phase will involve machines that are likely to emit noise that may be a disturbance to the neighbors. The construction work will involve earth moving equipment (excavators, trenchers, loaders) construction vehicles (tipper trucks, dumpers, trailers) and material handling equipment (cranes, conveyors, hoists). However, the developer will implement standard procedures to curb the noise effects like proper service of the machines, minimizing the recurrent transportation of the materials, personal protective equipment (PPEs) for the construction workers and regular updates to the adjacent neighbors on any changes that will directly affect them.

Air pollution

The area residents and neighbors raised concern that air pollution is likely to occur during the construction phase, the construction activities that are likely to cause air pollution include; land clearing, that is the trees that are in the site and all the vegetation cover, operation of diesel engines, excavation of the soil for example the land to be build used by proposed project, burning of vegetation cover and use of concrete, cement, wood, stone, silica which contain high levels of dust. They suggested that dust covers to be used during the transportation of materials like cement and sand, control dust through fine water sprays to dampen down the site, screen the whole site to stop dust spreading, or alternatively, place fine mesh screening close to the dust source. The developer (AKAGERA Aviation) should also ensure

that there's no burning of materials on site. The developer will take all the appropriate measures to curb all forms of air pollution as much as possible.

Accidents during construction

Concern was raised on the likeliness of accidents during the construction period. The common causes of these accidents could arise from.

- Crane accidents
- Equipment failures
- Injuries from a falling building or construction materials
- Accidents caused by defective products or equipment.

The table below summarizes the anticipated both positive and negatives impacts as expressed by participants in consultation at local level:

Table 22: Summary of anticipated both positive and negatives impacts expressed by participants in the meeting.

Anticipated project impacts	
Positive	Negative
<ul style="list-style-type: none"> ▪ Creation of employment to the local population. ▪ Creation of income generating activities around the project area ▪ Overall, the project has a huge potential to contribute to the Increase in security in the area. 	<ul style="list-style-type: none"> ▪ Increase in traffic and congestion of the road. ▪ Stress on sewage system ▪ Noise and Vibrations ▪ Air pollution ▪ Accidents



Figure 85: Photo of participants during the public consultation meeting

8.4.2 Formal meetings with high level stakeholders

On 8th, May 2023, a high-level stakeholder consultation for the Aircraft hangar and Center of Excellence aviation training center project was held with the purpose of presenting information on the project to a group of stakeholders, allowing stakeholders to comment, give opinions and views to be considered and incorporated in the project design and implementation; build impersonal relation with high level stakeholders; disseminate technical information; and record discussions.

Different concerns and opinions were raised and responded to, and care was taken to avoid the omission of any impact issues or concerns. During this consultation, the stakeholders were assured that stakeholder engagement would be a continuous process throughout the project construction and operation phases, so that their concerns and views are taken into consideration.

Table 23: Participants in the first-high level consultation

Attendants	Number of participants
Women	4
Men	11



Figure 86: Photo of participants in the high-level consultation meeting

On 15th May, a second high level consultative meeting was held with the purpose to collect comments on the draft ESIA Report that was shared by email with the representatives of the identified stakeholders that are able to comment on the ESIA report and provide inputs.

The table below shows participants in the second high level stakeholder consultation.

Table 24: Participants in the second-high level consultation

Attendants	Number of participants
Women	4
Men	8

8.5 Legal requirements

8.5.1 Rwandan EIA requirements

Rwandan EIA legislation and implementing guidelines contain specific provisions regarding stakeholder engagement and the EIA process. In the guidelines, it is stated that, "...from a social standpoint, EIA incorporates interests of public and private stakeholders, residents and communities in the planning and approval process of projects." Stakeholders, including communities, are to be consulted early in the EIA process; especially during the scoping phase when a project brief is to be prepared by the developer for submission to REMA for review and for them to develop a Terms of Reference for the EIA. Stakeholders can also be consulted at other times during the EIA process and, particularly, play a role, in advising, "project developers and Rwanda Environment Management Authority on approaches to avoid, minimize or compensate for adverse environmental impacts."

EIA reports and accompanying Environmental Management and Monitoring Plans (EMMPs) are submitted to the Rwanda Environment Management Authority (REMA/Rwanda Development Board (RDB), which are mandated to consult with other government entities (by providing them with copies of the EIA Report and EMP for review and comment). Today and as specified in the Legal, Policy and Institutional Framework, RDB is approving Terms of Reference for ESIA and issuing Environmental Certificate.

For organizing and implementing public hearings as an input to the 'approval' process for a project. Public hearings are thus the main mechanism for community stakeholders to be involved as part of the EIA process.

Local governments also play an important role in the local-level aspects of managing the public hearings and in conveying local stakeholder comments on both the project and the disclosed EIA Report and EMP to REMA/RDB. Few details are provided on how this should be done by local governments. Project developers do not play a lead role; however, they are expected to participate in all public hearings.

8.5.2 African Development Bank Group (AfDB) requirements

The African Development Bank Group (AfDB) presents its Integrated Safeguards System, a cornerstone of its strategy to promote growth that is socially inclusive and environmentally sustainable. Safeguards are a powerful tool for identifying risks, reducing development costs, and improving project sustainability, thus benefiting affected communities, and helping to preserve the environment. The Bank has adopted five Operational Safeguards (Oss) to achieve the goals and optimal functioning of the ISS.

OS1 on Environmental and Social Assessment has the objective to mainstream environmental and social considerations including those related to climate change vulnerability into Bank operations and thereby contribute to sustainable development in the region. One of its specific objectives is to provide for stakeholders' participation during the consultation process so that affected communities and stakeholders have timely access to information in suitable forms about Bank operations and are consulted meaningfully about issues that may affect them.

Consultation and participation

The borrower or client is responsible for conducting and providing evidence of meaningful consultation (i.e., consultation that is free, prior, and informed) with communities likely to be affected by environmental and social impacts, and with local stakeholders, and also for ensuring broad community support. Consultation is undertaken with reference to the updated IESIA Guidance Notes on consultation, participation, and broad community support, which also provide guidance on affected communities' involvement in the process of project planning, implementation and monitoring.

Consultation is based on stakeholder analysis and is preceded by disclosure of adequate project information and environmental and social information to ensure that participants are fully informed. It begins at an early stage during project preparation and continues as needed. It is conducted in a timely manner in the context of key project preparation steps, in an appropriate language, and in an accessible place. The results of the consultation are adequately reflected in the project design and in the project documentation. For Category 2 projects, the communities and stakeholders are consulted about the draft environmental and social assessment report and the draft ESMP. Consultation should be conducted with the objective of ensuring that the project has broad community support, and that affected people endorse the proposed mitigation and management measures.

Disclosure and access to information

The Bank's policy on disclosure and access to Information is based on the principle of maximum disclosure, enhanced access to information, and limited exceptions. The Bank applies these principles to the environmental and social assessment process, ensuring progressive disclosure of documents at key stages during the project cycle and making documents available to the public on request, through the

Integrated Safeguards Tracking System (ISTS). The basic purpose of the ISTS, as an integral part of the ESAPs, is to facilitate the verification of project compliance with the requirements set out in the OSs, over the course of the project cycle. Environmental and social assessment documents are made public at relevant stages of the project cycle through the ISTS, which is disclosed on the AfDB websites.

Borrowers also disclose assessment documents in appropriate national and local settings under the direct responsibility and supervision of relevant national/local authorities. Disclosure commences early in project preparation to allow the public, beyond the mandatory consultation process, to genuinely participate in project design and implementation. This enables communities in project areas to voice their concerns and aspirations and reap true benefits from project related developments.

Grievance and redress mechanism

The borrower or client establishes a credible, independent, and empowered local grievance and redress mechanism to receive, facilitate and follow up on the resolution of affected people's grievances and concerns about the environmental and social performance of the project. The local grievance mechanism needs to be always accessible to the stakeholders during the project cycle, and all responses to grievances are recorded and included in project supervision formats and reports.

8.6 Consultation Results

8.6.1 Introduction

The results (concerns/impact issues) of all consultations are summarized and presented in a series of tables below. Also, responses were provided, when applicable, to the concerns/impact issues raised. These are responses provided directly by stakeholders, during specific consultation meetings, or by the ESIA team at the end of the ESIA preparation process when it was clear where a concern/impact issue was addressed in the ESIA Report. Thus, these tables provide feedback, indirectly, to the consulted stakeholders. The tables below provide a summary of the perspectives and concerns expressed during the public and high-level consultations.

Table 25: Summary of views, concerns, and opinions raised in the public consultation.

Stake Holder's Name, Institution & Role	Concerns, opinions, and recommendations	Comments on Public Consultation and Technical Processes
Joseph Murinda Engineer Akagera Aircraft	What measures can be taken to ensure that the site remains easily accessible despite the traffic patterns in Kanombe?	A study was conducted to analyze the traffic patterns around the project site and appropriate measures will be put in place during both the construction and operation phases to prevent any potential problems.
Joseph Ndayishimiye Akagera Aircraft	What measures will be taken to ensure security in the project area considering the magnitude and sensitivity of the project?	The project development will be secured similarly to the existing KIA, during both the construction and operation phases to guarantee the presence of adequate security measures for the surrounding areas.
Faustin Muhunde Akagera Aircraft	Further information on the job opportunities that will be generated by the proposed development project was provided. There were recommendations made to install road safety signs so that people approaching the project site can be aware of its proximity.	As per the suggestion, there will be road signs installed to indicate that there is an ongoing development in the area and that the necessary construction site regulations should be implemented.
Ms Cyineza Bora Josiane Nyarugunga social affair officer	What steps will be taken to address noise pollution, considering the operations of aircraft in the area?	The potential noise issues were taken into consideration during planning, for example placing the hostels on the lower level of the academy to reduce the noise level. To ensure minimal noise emissions, there will be an emphasis on maintaining the aircraft, and the planes used by Akagera Aviation will have efficient systems in place to limit noise levels.
	Given the sensitivity of the project and the increased security measures, will the residents and road users continue to use the roads passing through the project area as they used to?	The existing roads will remain open, and residents can continue accessing them for their daily activities.

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	Will the proposed project affect the accessibility of essential amenities such as water and power supply for the residents of Nyarugunga sector?	The development project will not have any significant adverse effects that cannot be addressed, particularly with regards to the accessibility of basic amenities for the neighboring residents, such as water. The project will have its own water storage tanks, and this will minimize reliance on public water supply systems. Additionally, the project will incorporate rainwater harvesting to supplement the water supply on the site.
Uwera Annah	What measures will be taken to address the destruction of vegetation on the project site?	The project will implement re-vegetation practices to restore the vegetation as much as possible.
Habyarimana Jean Callixte engineer	It was emphasized that the current road leading to the academy project site would be constructed to high standards and made accessible to both pedestrians and vehicles.	It was mentioned that in addition to the existing well-built roads that provide access to the project site, a new road will be constructed to connect the hangar and academy.
Nkunzi Nicolas	It was emphasized that the establishment of a project of such magnitude would have positive impacts, such as improved security and the opening of local businesses.	The suggestion was received positively, and examples were provided to illustrate how large-scale projects such as this one can stimulate the local economy by creating business opportunities.
Mutabazi Augustin	What enhancement measures will be taken to ensure the project development continues to create job opportunities for future generations?	There is room for expansion, therefore as the project facilities grow, there will be more opportunities for employment and better facilities for future generations.
Habonimana Pascal Sanitation officer	Considering that the proposed project will lead to an increase in population, what measures need to be taken to prevent an increase in demand and pressure on essential resources such as water and power?	<p>To address the potential increase in population due to the proposed project, measures have been put in place to avoid adding pressure to essential resources such as water supply. Rainwater harvesting and wastewater treatment for re-use will be incorporated in the project to manage water usage. This will reduce the demand for water from external sources and decrease the pressure on the existing water supply.</p> <p>Additionally, power-saving measures will be implemented to reduce the energy consumption of the project, and where possible, renewable energy sources will be utilized. These measures aim to ensure that the development does not put undue strain on essential resources while catering to the growing population.</p>

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Patrick Nkulikiyimfura Managing Director	Are there any suggested measures to mitigate the impact of solid waste management resulting from the proposed project?	The proposed project includes a waste management plan that aims to separate solid waste into biodegradable and non-biodegradable components. This will enable the project to maximize reuse and recycling of waste materials and minimize the amount of waste that ends up in landfills. The project team will also explore opportunities to repurpose waste materials for other uses.
	Has the impact of traffic trends during the construction and operation phase been considered, and how will it be managed to ensure that the local community is not negatively affected?	The impact of traffic trends during the construction and operation phase has been considered, and measures have been taken to ensure that the local community is not negatively affected. Flying lessons will be conducted in less residential areas, and the trainees will be accompanied by highly qualified trainers to minimize the risk of accidents. In addition, traffic management plans will be put in place during the construction and operation phases to minimize disruptions to the local community.
Mrs Rwigema Francine Local citizen	Will the increase in noise generated during the implementation cause more discomfort for the local community due to the higher levels of noise in the area?"	<p>The potential noise issues were taken into consideration during planning, for example placing the hostels on the lower level of the academy to reduce the noise level.</p> <p>To ensure minimal noise emissions, there will be an emphasis on maintaining the aircraft, and the planes used by Akagera Aviation will have efficient systems in place to limit noise levels.</p>
Bamurange Beatrice Cell leader	What are the potential benefits of the proposed development in the area, and how will the local population be able to benefit from these developments?	The proposed development in the area is expected to bring about several benefits to the local population, such as employment opportunities during the construction phase and the opening of certain facilities to the public, including a swimming pool during the operation phase. These benefits will not only enhance the quality of life for the local population but also contribute to the growth of the local economy
Ntakirutimana Jefferson	In the Environmental Impact Assessment (EIA) process, how is the issue of air pollution generated by the proposed project being addressed?	In the case of air pollution, the EIA process may involve assessing the potential sources of pollution associated with the proposed project (such as emissions from aircraft or ground vehicles) and proposing measures to minimize or mitigate these impacts (such as improving air quality monitoring or implementing pollution control technologies).

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	How will the drainage system be designed to ensure that the needs of both the local population and the proposed development are met?	Regarding the drainage system, it will be important to design a system that can accommodate the needs of both the local population and the proposed development. This may involve assessing the capacity of existing drainage infrastructure in the area and proposing modifications or additions to ensure that the system can handle increased demand.
Egide Mbane Helicopter pilot	What is the potential impact of the proposed development on the aesthetic value of the surrounding region?	The proposed development aims to provide high-quality infrastructure that is harmonious with the surrounding environment. Therefore, it is anticipated that the impact on the aesthetic value of the region will be positive. The development will be designed with careful consideration to the existing landscape and architecture, and efforts will be made to minimize any negative impact on the natural scenery. Additionally, the development will aim to enhance the beauty of the region by incorporating green areas and landscaping features.
Umurerwa Agnes Local Citizen	What measures will be taken to address the loss of flora and fauna during the construction phase of the proposed project?	As part of the proposed project, measures will be taken to address the loss of flora and fauna during the construction phase. This includes replanting trees, especially endangered species that may be impacted by the construction. The replanting will aim to restore the natural habitat and biodiversity of the area. Additionally, measures will be taken to minimize the disturbance to wildlife during the construction process, such as implementing designated areas for construction activities and avoiding sensitive habitats.
Jean Pierre Ndayisenga Project Manager	How is the management of solid and liquid waste addressed in the proposed project? What are the necessary processes for project approval and development to proceed? Can you provide more information on the steps and requirements involved in this process?	The management of solid and liquid waste in the proposed construction of the hangar and academy training center, there should be a comprehensive waste management plan in place that outlines the procedures for waste handling, storage, transportation, and disposal. This plan should also include measures to minimize waste generation, separate and sort waste, and promote recycling and reuse where feasible. There will be EIA report to be submitted to RBD for approval.

Table 26: Summary of concerns, views, and opinions raised during the first high-level stakeholder consultations.

No	Views and opinions/ concerns	Response provided
1	The proposed project is a fantastic project which will benefit the aviation industry as well as the country. Could you provide more specific details regarding the proposed project's phase-wise timeline and the anticipated implementation planning?	Prior to commencing the implementation of the proposed project, several prerequisite procedures need to be carried out. Notably, the Environmental and Social Impact Assessment (ESIA) is being conducted concurrently with the feasibility study. The target timeline for executing the project is set for 2024, and it is expected that within two years of its launch, the project will be operational. It is worth mentioning that the training activities will persist until the completion of the center of excellence.
2	I'd like to know if the mandatory internal training programs that all companies operating in KIA have will be consolidated into the proposed academy, or if they will remain separate.	As part of the ATL establishment, Akagera Aviation Ltd has been designated as the training provider for aviation in the country. Currently, they offer flight operation training, but over the next decade, they will expand to provide all types of training.
3	Who will be managing the proposed project?	Akagera aviation Ltd.
4	What are the operational impacts that the assessment has identified as likely to occur on a daily basis, and what steps will be taken to manage and mitigate those impacts?	During the presentation, the anticipated impacts were discussed, and we would like to hear your opinions and comments regarding these impacts. Some of the impacts mentioned were bird strikes, air and noise pollution, fire and electrical hazards, waste generation, accidental spills, insecurity, micro-climate modification, and disturbance to the natural environment. In the ESIA perspective, all project components, including those that will be linked to the existing KIA, were considered. For example, the report recommended the construction of a wastewater treatment plant for the proposed academy since it is not within the KIA.
5	Can you clarify whether the fire protection system being proposed for the new project will be integrated with the existing firefighting and brigade at KIA, or will it be a separate system not connected to the airport?	It is not intended to have a separate fire protection system for the proposed project. Instead, the plan is to install automatic firefighting systems on the site, which will be supported by the existing KIA fire brigade in case the system is unable to effectively manage a fire incident.

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6	The ESIA should showcase the Rwanda Green Building Minimum Compliance System, which is mandatory for new educational structures and a recommended approach, as well as the project's alignment with the SDGs. Additionally, detail the effects of the project on the neighboring communities.	The study has taken into account the requirements of the Rwanda Green Building Minimum Compliance System, and as a result, suggests environmentally friendly building practices and technology that the developer should incorporate into the design.
7	It is important to consider how the management of birdlife and wildlife will be approached at the construction site, as construction areas typically attract birds.	The effective management of birds is a vital aspect for airport facilities. The potential threat of bird strike hazards is currently being evaluated, and various measures to mitigate this risk have been suggested. It is recommended that the management methods already in place at the present KIA should be shared and incorporated into these mitigation measures.
8	In the assessment, it is essential to give careful attention to the management of soil erosion during construction and dust control during aircraft takeoff and landing.	<p>The study proposes several measures to mitigate soil erosion, including the implementation of silt fences, retaining structures, and other appropriate techniques.</p> <p>The study has given consideration to the issue of dust generation during aircraft takeoff and landing and will suggest several measures for control and mitigation.</p>
9	Will the project facilities be dependent on the power and water supply of the existing KIA, or will they have their own separate supply?	<p>The project has examined two options for its power and water supply. The first option involves connecting both the hangar and academy to the existing water tank and substation at KIA for their respective water and power needs. The second option involves connecting only the hangar to KIA's water tank and substation, while the academy connects directly to the public municipal distribution system (REG for power and WASAC for water).</p> <p>However, it is recommended that the most cost-effective option would be to connect the hangar to the existing water tank for water needs and the existing substation for power needs, while the academy connects to the public electricity distribution system (REG) and water distribution system (WASAC).</p>

Table 27: Summary of concerns, views, and opinions raised during the second high-level stakeholder consultations.

No	Views and opinions/ concerns	Response provided
1	How will the issue of radiation reflection, which could potentially cause disruptions due to the presence of solar panels on the roof of the facilities, be addressed to prevent harm to the pilot's eyes and lead to accidents?	While the adoption of renewable energy is highly desirable, it is crucial to ensure that the installation of solar panels does not interfere with the pilot's vision due to any reflections they might produce. Therefore, additional studies will be conducted to guarantee the use of solar panels in a way that do not pose a problem.
2	With different activities being undertaken in facilities there may be risk of fire hazards, how would it be dealt with?	A fire suppression system has been proposed for both the aircraft hangar and the center of excellence aviation training center to address fire incidents. This system involves the release of fire foam and water, which will effectively suppress and prevent the spread of fires. The facilities will also be equipped with firefighting equipment such as fire extinguishers and others.
3	In order to prevent any form of harassment, how will the design of the center of excellence ensure a safe environment for both girls and boys?	The design has made sure to provide different accommodations for boys and girls at the center of excellence aviation training center.
4	Given the scale of the project and the heightened security requirements at the project location, how will security measures and the management of facilities be effectively addressed and handled?	As the aircraft hangar is situated within Kigali International Airport and the center of excellence aviation training center is in close proximity with access to the airport, the security arrangements for both facilities will be integrated into the overall security plan of the airport.
5	Considering the critical requirement for continuous power supply at the aircraft hangar and the center of excellence aviation training center, how will this need be effectively addressed and ensured without any interruptions?	To ensure a reliable power supply for the aircraft hangar and the center of excellence aviation training center, both facilities will be connected to the substation of Kigali International Airport, where a backup generator is in place in case of a power cut.
6	How will the continuous supply of water be guaranteed at the aircraft hangar and the center of excellence aviation training center, given the critical importance of this resource for their operations?	In order to maintain a consistent water supply, the aircraft hangar will be linked to the current water supply system at Kigali International Airport or nearby WASAC tanks. Similarly, the center of excellence aviation training center will be connected to the public water supply system in the surrounding region, ensuring uninterrupted access to water for both facilities.

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7	In order to attain its objective of becoming a prestigious aviation school, how will the center of excellence aviation training center ensure the quality and comprehensiveness of the qualifications it will provide?	To establish itself as a highly reputable institution, the center of excellence aviation training center will possess ample training facilities. Additionally, the school will form partnerships with esteemed higher learning institutions like Coventry University to deliver diverse aviation courses to trainees, thereby solidifying its position as a provider of top-notch qualifications in the aviation sector.
8	When it comes to stormwater management, how will the proposed facilities ensure proper handling of the drainage system to prevent any mismanagement that may result in potential disasters?	As a recommended approach, it is proposed that the upcoming facilities be connected to the existing drainage system in the vicinity of Kigali International Airport (KIA). This is due to the well-designed nature of the current drainage system, which effectively channels water down to the Rubilizi wetland. Therefore, establishing a connection to this system is considered a preferable solution.
9	Considering the inevitability of noise generation from the operations of the aircraft hangar and the center of excellence aviation training center, which are located in close proximity to flight activities, how will measures be implemented to mitigate the potential impacts of noise?	Akagera Aviation stated that the aircraft used for pilot training are expected to have minimal noise emissions due to their small size. Furthermore, as part of their ambitious objective, they plan to acquire aircraft models that produce reduced or no noise at all.

8.7 Stakeholder's Engagement during project implementation

In order to clearly develop a systematic and effective means of engagement, stakeholders should be identified in relation to the project components to be undertaken and mapped out to understand their interests in these development activities, from which a plan is drawn on how to continuously engage with these stakeholders as the project is implemented. Under this section, a stakeholder mapping and a stakeholder engagement plan have been developed.

Stakeholders identified and mapped for inclusion in engagement activities under the Project meet one or more of the following criteria:

- i. Have an interest in the various Project activities.
- ii. Would potentially be impacted by or have an influence on the various Project activities (negatively or positively); or
- iii. Could provide commentary on issues and concerns related to the various Project activities.

Stakeholders were categorized, based on their various needs, interests, vulnerability, and potential influence on the project as outlined here in.

Table 28: Stakeholder mapping

	Stakeholder Group	Interests in Project/ objective of engagement	Significance of influence	Significance of Interest
	Developer: <ul style="list-style-type: none">Akagera Aviation Ltd	<ul style="list-style-type: none">Developer representatives for the project preparation and implementation.Funds transfer and management.Compliance enforcement.	High	High
	Local Government: <ul style="list-style-type: none">Nyarugunga Sector	<ul style="list-style-type: none">Monitor progress on the area development.Compliance enforcement.	Medium	High

	Stakeholder Group	Interests in Project/ objective of engagement	Significance of influence	Significance of Interest
Other Interested Parties	Central Government (Ministries and Agencies): <ul style="list-style-type: none"> Ministry of Infrastructure (MININFRA). Ministry of Environment (MoE). Ministry of Gender and Family Promotion (MIGEPROF) Rwanda Development Board (RDB). Rwanda Environmental Management Authority (REMA) Rwanda Civil Aviation Authority (RCAA) Aviation Travel Logistics (ATL) Rwanda Airports Company, (RAC) 	<ul style="list-style-type: none"> Overseeing the project implementation. Inspection of construction works. Compliance enforcement. Permit and licensing. 	Medium	High
	Local Government: <ul style="list-style-type: none"> Kicukiro District. Corresponding sector, cells, and village along the project area 	<ul style="list-style-type: none"> Local project mobilization. compliance enforcement. Grievance Management. 	Medium	Medium
	Private sector <ul style="list-style-type: none"> Contractors and sub-contractors. Potential investors in project activities. e.g. recreational activities. Private universities. 	<ul style="list-style-type: none"> Supply of Project inputs and management of outputs. Professional and technical services to the projects. 	Medium	Medium
	International Development Partners <ul style="list-style-type: none"> AfDB 	<ul style="list-style-type: none"> Project loan financing. Environmental and social safeguard compliance. 	High	High

	Stakeholder Group	Interests in Project/ objective of engagement	Significance of influence	Significance of Interest
	Media, Political Parties/groups, Religious Organizations <ul style="list-style-type: none"> • District Media (radio stations). • National and international Media (newspapers, television, and radio stations). • Religious denominations. 	<ul style="list-style-type: none"> • Key role in disseminating information on the efforts and results of the project to the public. • Influence on public views and opinions on the projects. 	Low	Medium
	Law Enforcement Agencies <ul style="list-style-type: none"> • District Administration Security Support Organ (DASSO) • Rwanda National Police. 	<ul style="list-style-type: none"> • Security 	Low	Medium

The following Stakeholder Engagement Plan (SEP) outlines the purpose of engagement, communication channels, platforms of engagement, how frequent and who is responsible for stakeholder engagement during project implementation.

Table 29: Stakeholder Engagement Plan during project implementation

Stakeholder Group	Project stage/phase	Communication channel	Purpose	Platform/ venue of engagement	Frequency	Responsibility
Central Government ministries and Agencies:	<ul style="list-style-type: none"> Preparation Implementation Post implementation 	<ul style="list-style-type: none"> Official Meetings Survey studies Beneficiary Dialogues Disclosure meetings Grievance redress mechanisms 	<ul style="list-style-type: none"> Reaching out to potential beneficiaries and community Understanding issues arising from project actions Resolving project related grievances. 	<ul style="list-style-type: none"> REMA offices. Project site offices. Local government offices. (Village, cell, sector, and district offices) Digital platforms. Project area. 	As often as is required.	<ul style="list-style-type: none"> Akagera Aviation Ltd

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Stakeholder Group	Project stage/phase	Communication channel	Purpose	Platform/ venue of engagement	Frequency	Responsibility
Central Government (Ministries and Agencies):	<ul style="list-style-type: none"> Preparation Implementation Post implementation 	<ul style="list-style-type: none"> Official meetings Project implementation support activities Supervision missions to the project site Opening and closing meetings Disclosure meetings Digital communication tools 	<ul style="list-style-type: none"> Providing regular updates Monitoring project implementation progress Organizing Capacity building. Ensuring compliance is met. 	<ul style="list-style-type: none"> Institutions' offices. Digital platforms. 	<p>Quarterly Official coordination meetings.</p> <p>Monthly Project monitoring team meetings.</p> <p>Visits and supervision missions: As needed</p>	<ul style="list-style-type: none"> Akagera Aviation Ltd

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Stakeholder Group	Project stage/phase	Communication channel	Purpose	Platform/ venue of engagement	Frequency	Responsibility
Local Government:	<ul style="list-style-type: none"> Preparation Implementation Post-Implementation 	<ul style="list-style-type: none"> Public consultations meetings Beneficiary Dialogues Opening and closing meetings Digital communication tools. 	<ul style="list-style-type: none"> Keeping stakeholders informed Providing regular updates. Resolving grievances arising from project activities 	<ul style="list-style-type: none"> Meetings and Public notices at local government offices. Digital Platforms. 	As required	Kicukiro District
Private sector (Contractors and sub-contractors. Potential investors in project activities. e.g. recreational activities.)	<ul style="list-style-type: none"> Implementation 	<ul style="list-style-type: none"> Tender announcements and contract award. Opening and closing meetings. Site meetings Supervision missions to the project sites. 	<ul style="list-style-type: none"> Procurement of technical and consultancy services. Compliance enforcement. Project commencement and handover. Providing regular project updates. 	<ul style="list-style-type: none"> Site offices. Digital platforms. Web sites 	As required	<ul style="list-style-type: none"> Akagera Aviation Ltd contractor

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Stakeholder Group	Project stage/phase	Communication channel	Purpose	Platform/venue of engagement	Frequency	Responsibility
International Development Partners	<ul style="list-style-type: none"> Preparation Implementation 	<ul style="list-style-type: none"> Official meetings Disclosure meetings Opening and closing meetings Digital communication tools 	<ul style="list-style-type: none"> Ensuring compliance is met. Collecting regular updates on project progress. 	<ul style="list-style-type: none"> Akagera Aviation Office Site offices Digital Platforms 	As required	<ul style="list-style-type: none"> Akagera Aviation Ltd
Media	Implementation	<ul style="list-style-type: none"> Press releases Audio-visual stories Project websites Social Media Channels developed for the Project. TV/Radio Project e-mail address Press conferences. Digital communication tools 	<ul style="list-style-type: none"> To keep the stakeholders and the public informed To provide regular updates about the Project 	Digital platforms	As required	<ul style="list-style-type: none"> Akagera Aviation Ltd

8.8 Grievance Redress Mechanism

A grievance mechanism has been developed for potential use by Interested and Affected Parties. The aim of the grievance mechanism is to achieve mutually agreed resolution of grievances raised by such parties or stakeholders. This grievance mechanism ensures that complaints and grievances are addressed in good faith and through a transparent and impartial process, but one which is culturally acceptable.

8.8.1 Organization and responsibilities

Within the Project Company, a unit will be assigned specifically to complaints-Management Unit or the CMU. The CMU will be responsible for capturing, recording, filing complaints and handling of each complaint, namely the analysis, interpretation, foundation, remedies, and solutions. It shall hold a record of complaints register. These complains include those from workers during construction and operation, GBV, SEA grievances and grievances from the community.

Upstream, it will be seized or have knowledge of complaints through several channels:

- Direct filing by complainant at the office of the CMU in writing or orally.
- Recourse notebooks that will be given weekly by the family counsellors.
- Local authorities etc
- Employees

The Grievance Manager will:

- Implement the Grievance Redress Mechanism procedure and management system providing guidance on solutions to complaints and grievances in consultation with the relevant departments and ensure consistency of redress for all grievances received in relation to the project proponent.
- Promote the Grievance Redress Mechanism to maintain momentum and ensure company wide and community commitment to, and understanding of, its implementation and operation.
- Involvement in the investigation of grievances and the agreement of redress as well as overseeing interaction between various Akagera Aviation Ltd departments and contractors as well as the senior managers as required.
- Receive and acknowledge any issue, concern, complaint, or grievance from the community, verbally or in writing. They will record the issue and report it to the Grievance Manager in compliance with the Grievance Redress Mechanism procedure.
- Involvement in the investigation of grievances as required depending on the nature and severity of the grievance and as directed by the Grievance Management team.

8.8.2 Responsibilities of the CMU

The responsibilities of the CMU are as follows:

- Centralize and deal objectively with all complaints.
- Conduct a review of the admissibility of each complaint.
- For each complaint admitted, assess compliance with registration policies (object, name and surname of the plaintiff, signature, observation etc.), and validate the facts.
- Acknowledge complaints directly to the Project Company and the relay to the headquarters of the Company.
- Coordinate with all stakeholders in order to gather all the opinions and inside information available for the various complaints.
- Manage the findings at the return of complaints investigated.
- Write the answers for the complainants as soon as possible.
- Ensure the dissemination of solutions to the persons concerned through appropriate channels.
- Suggest plausible solutions to the Project Company.

8.8.3 Procedure of filing a formal/informal complaint/ grievance

- Any complainant to the aircraft hangar and CoE aviation training centre project may lodge a complaint.
- Complaint should be made to Grievance Redress Mechanism Committee.
- Complaint may be reported orally or by writing and submit it in suggestion box or to the committee. If the complaint is oral, it will be converted into a written form by the GRMC member who received the complaint and authenticated by the complainant under his / her signature.
- The complainant can also file his complain anonymously without indicating names and addresses and expect a response. The grievance will be treated with the same concern and as per the defined time frame.

8.8.4 Mechanisms for redressing grievances

Conflicts, claims and grievances may arise at different stages of the project and be of very different in nature. Some of the conflicts will not be directly related to the project but will interact with it.

The following mechanisms are provided:

- It is essential that disputes that might arise be resolved in arbitration using the institutions and customs of the Rwandan society, the Abunzi, or mediators. In the application of their standards, they may have to decide which measures will prove detrimental to the plaintiffs, including women, and several studies have highlighted it.
- The mechanisms are well established and the contribution of Abunzi revealed invaluable: they can be easily recruited and intervene for any grievance that was not addressed amicably.

Conflicts related to the Project.

Various complaints of different levels of severity may rise with regard to the project. Such disputes shall be resolved in different ways involving different treatment levels and different organs.

- By more detailed additional explanations highlighting any terms, methods, techniques used for a particular component so that the complainant and the community are better informed.
- It will be a priority to request the Sexual Exploitation and Abuse (SEA) to provide this additional information. The handling is internal as it involves the SEA.
- For the repair of the grievance involving the modification measures, the adoption of new measures, and repair of damage.
- Will come into the picture according to the grounds of objections.
- Compensation commissions.
- The Project Company (via the SEA) that will order the subcontractors to repair.
- By arbitration, resorting this time to an external legal authority: the mediator.
- At the end when the complaint does not find solutions at the mediator's level or the person (natural or legal) desires, the complaint is taken through the normal channels provided by judicial institutions in the country.

labor related grievance mechanism

In order to create a working environment that provides safety and security to all workers, contractors will be required to present a worker's grievance redress mechanism which responds to the requirements of national labour Law and AfDB OS5. For direct workers, the mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides feedback to those concerned, without any retribution. The contractor will inform the workers of the grievance mechanism at the time of hiring and make it easily accessible to them.

GRM communication channels

In order to communicate all information regarding the GRM to the targeted audience, the developer will need to have platforms and utilize already existing avenue to reach their stakeholders at the different tiers. It is noteworthy that the communication channels will vary for each target audience due to group dynamics and accessibility of such platforms especially to the project beneficiaries and local communities. The developer staff will use the communication channels listed depending on its target audience:

- a) Print media, e.g., posters, flyers, booklets, notices
- b) social media; that is Facebook, Twitter, Whatsapp
- c) Use of ICT
- d) Radio stations
- e) Television stations

In addition, the following communication activities and methods will be conducted to promote a two-way communication between Akagera Aviation ltd and all its relevant stakeholders, that is,

- a) Setting up Programmer's Intranet
- b) Information sessions and workshops on GRM
- c) Bulletins.
- d) GRM awareness literature
- e) public forums.
- f) Training on GRM procedures and structure at the community level.

Removing Barriers to Complaining

Some strategies to reduce these barriers are:

- Establishing grievance uptake locations in areas where poor and marginalized people live
- Engaging local intermediaries (community based or civil society organizations) to facilitate submission of grievances.
- Deploying community-specific communication strategies to allay fears about and increase comfort levels for submitting grievances.
- Ensuring that there is no formal or informal charge for making grievances.
- Treating grievances confidentially.

Setting up a Basic GRM

- Assign a specific email id, phone number.
- Set up an easy to access "Suggestion/Grievance box".
- Designate a complaint handling officer to receive, log, monitor or track grievances; grievances can be registered into grievance logbooks manually.
- Modify the project website (if any) to create a permanent sub-window that facilitates collection of complaints.
- Suggest timeframes and procedures to receive, log, monitor or track complaints and respond to complainants.
- Assign complaint resolution responsibilities to existing staff.
- Design a simple, easy to use, excel-based or logbook-based complaint registration and monitoring database.
- Regularly review feedback received, cases resolved and complaints trends in resettlement review meetings.

The database shall be monitored regularly for recurring grievances so that appropriate mitigation can be developed. As a minimum the following information shall be recorded:

- Case number
- Complainant's name and contact details
- Date of complaint
- Details of complaint
- History of other complaints / queries / questions (if known)
- Resolutions discussed and agreed with the party(ies) in question.
- Actions implemented (including dates)
- Outcome of the actions implemented.

Tips for Receiving a Grievance

- Regardless of who receives the grievance, it needs to be forwarded to Grievance Manager for attention.
- The grievance redress mechanism should make it possible to lodge a grievance in any appropriate format (written, verbal, telephonic, email, post etc.). Consideration should be given to capturing concerns raised informally or indirectly (e.g., through perception studies, media reports, social media, etc.).
- It is important that the process is easily accessible and not intimidating to stakeholders.
- Regardless of the form of the complaints, all need to be addressed with the same sincerity and seriousness.
- The Grievance Manager will be required to be in touch with the complainant at least once per month to provide feedback on the grievance.

Grievance Channel for GBV

As GBV/SEA/SH requires timely access to quality, multi-sectoral services and involves confidentiality and informed consent of the GBV survivor, the project/contractor will recruit a GBV specialist to develop a GBV Action plan that will include an Accountability and Response Framework, and this will form part of project C-ESMP. GBV Action Plan will identify service providers in the project areas with minimum package of services (health, psychosocial, legal/security, safehouse/shelter, livelihood). The GBV Action Plan will also provide enough details to allow for the development of a localized referral pathways and establish procedures of handling cases as part of the service providers mapping. The bidding documents will clearly define GBV requirements, including the requirement for a CoC. During works, separate facilities for women & men, GBV-free zone signage.

Mediator

The mediator will have to deal with all complaints, which will not have found solutions at the previous levels.

The figure below presents the grievance or dispute resolution process by showing each step to be followed and responsible actors.

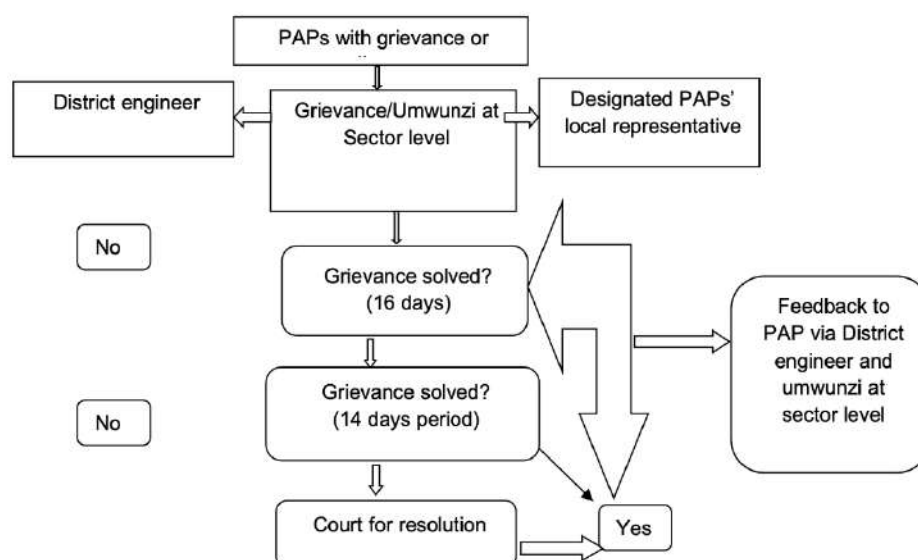


Figure 87: Proposed grievance or dispute resolution process

To manage grievances and complaints, the following principles will be followed:

- Any grievance will be registered, acknowledged receipt of within 7 calendar days of its receipt, responded to within 14 calendar days of its receipt with proposed acceptable resolution, and tracked until it is closed.
- Members are free to go straight to the Judicial System/Court or when they are not satisfied with the outcome proposed by the amicable mechanism.
- The grievance management system will be widely publicized in order to increase access to local people.

The existence of the grievance mechanism, as well as the ways to raise a complaint (where, when, to whom, etc.), will be broadly communicated in the project area during further public consultation meetings and contact details for raising grievances will be shared with all stakeholders. For each grievance, the following details will be captured:

- The person who is aggrieved.
- Summary of the grievance.
- Proposed action/referrals.
- Outcome, which shows either closure or referral.

The investigation of the received grievance will typically include the following steps:

- Allocation of the grievance to a relevant person who will deal with the grievance.
- If necessary, a visit of the area where incident occurred or disputed properties/ plot boundaries, and discussions/ a meeting with the complainant (and possibly third parties, as need be);
- An internal meeting among the stakeholders involved in the grievance management to decide on the proposed solution.
- Every level to make report on the resolutions taken and submit to Developer for filing/further action.
- Writing a letter to the complainant describing the proposed solution.

The grievance is classified as “closed” at any level when the complainant receives the letter with the proposed solution. If the agreement on the proposed solution has not been reached, the grievance is escalated to the subsequent level.

Identification of Grievance Prone Areas and Analysis

Identify areas susceptible to corruption and/or grievance generation and conduct work audit of such areas. In addition, consider external/social audit in areas of very high public interface, with the aim of identifying wrong doers and improving processes and systems. Involve stakeholders in the exercise.

Analyze the nature and cause of grievances with the aim of identifying systemic deficiencies in laws, rules, regulations, policies, instructions, work practices and procedures, and effecting systemic changes to remove/correct these deficiencies. The Directors (or officers) of Grievances be the nodal officers for such purpose. The analysis should be conducted in the third week every month and studies of identified grievance prone areas be undertaken. Recommendations made in the studies should be implemented by end of that month so as to bring systemic changes and remove the cause of grievances.

Fix responsibility in each and every case of delay, default or dereliction in performance of everyday duties on failure to deliver services and take disciplinary action to avoid recurrence. This will send a clear signal that in the event of failure to perform duties or deal appropriately with grievances within the time frame norms prescribed, a real possibility of having responsibility fixed on one's shoulder exists. Consider the feasibility of prescribing specific penalty clauses in such cases.

Formulation and effective implementation of Citizen's Charters, which should, inter-alia, include disclosure of time norms for providing various services to the citizens/clients and details of all levels of grievance redress machinery that may be approached. Make Public Grievance Redress and Monitoring System (PGRAMS) software, operational with every Director of Grievances. This shall enable the Director of Grievances to immediately place the details of grievances received in a database (efficient 'dak' management) as well as record the fact whether he intends to monitor its progress, identify the section/division where it is being sent, etc., generate the time taken in dealing with the grievance, enable review of pending grievances in the organization, generate acknowledgements to complainants, conduct analysis etc. The system should also have the facility of on-line registration of grievances by the citizens and access to information on the status of his/her grievances.

Grievance resolution approach

The relevant local administration will attempt to resolve the problem (through dialogue, negotiation and mediation) within the duration of the complaint resolution. If the grievance is not resolved in this way, the dissatisfied party can refer the matter to Access to Justice Bureaus (MAJ) for mediation. The Ministry of Justice has established Access to Justice Bureaus (MAJ) at every District level (3 lawyers per District) as decentralized service to assist citizens to access legal aid at free cost. If dissatisfied the affected person can refer the matter to the competent court. Local courts should be used. If not resolved, then the high court or court of appeal of Rwanda remains an avenue for voicing and resolving these complaints.

The channels of receiving complaints include presentation of complaints via face-to-face meetings, written complaints, telephones, email communication, third party.

Implement the response to resolve the grievance.

When there is an agreement between a complainant and the GRM staff to move forward with the proposed action or stakeholder process, then the response should be implemented. In cases where the initial response is to initiate broader stakeholder assessment and engagement, the assessment process may be conducted by GRM staff themselves, or by consultants or others perceived as impartial and effective by the Contractor, the developer, the complainant, and other stakeholders.

The main purpose of the assessment and engagement process is to clarify:

- The issues and events that have led to the complaint.
- The stakeholders involved in those issues and events.
- The stakeholders' views, interests, and concerns on the relevant issues.
- Whether key stakeholders are willing and able to engage in a joint, collaborative process (which may include joint fact finding, dialogue and/or negotiation) to resolve the issues.
- How the stakeholders will be represented, and what their decision-making authority will be.
- What work plan and time frame the stakeholders could use to work through the issues.
- What resources they will need, and who will contribute them.

In some cases, the stakeholder assessment will produce clarity and agreement among the key stakeholders on a collaborative approach to resolving the issues raised in the complaint. In others, the assessment may determine that one or more key stakeholders are unable or unwilling to participate. Whether or not a collaborative process appears viable, the GRM staff needs to communicate the assessment findings to the complainant and other stakeholders, with a recommendation on whether and how to proceed. If a collaborative approach is possible, then GRM staff is usually responsible for overseeing it. GRM staff may directly facilitate the stakeholders' work on the issues, by contract with a consultant facilitator, or use traditional and local consultation and dispute resolution procedures and leaders/facilitators.

If the engagement process produces agreement on actions to resolve the complaint, then the GRM staff is responsible for overseeing implementation of those actions. In a multi-stakeholder context, several actors may be involved in the solution. It is important for GRM staff and the stakeholders to monitor implementation jointly, and to "come back to the table" when needed to deal with challenges during implementation.

As noted above, in some cases it may not be possible to reach agreement with the complainant on the proposed response. In a multi-stakeholder dispute, an assessment process may lead to the conclusion that a collaborative approach is not feasible. When a collaborative approach is used, good faith efforts may not succeed in resolving key issues. In any of these situations, the GRM staff should review the situation with the complainant and see whether any modification of the response might meet the concerns of the complainant, the organization, and other stakeholders. If not, the GRM staff should inform the complainant about other alternatives that may be available, including the use of judicial or other administrative mechanisms for recourse. Whatever alternative the complainant chooses, is important for GRM staff to document their discussion with the complainant and the complainant's informed choice among alternatives.

9.0 CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion

The Environmental and Social Impact Assessment (ESIA) study outlines the Aircraft hangar and Center of Excellence aviation training center project's features, forecasts potential environmental and social effects, and suggests strategies to minimize any adverse impacts during all stages of the project. The study acknowledges the project's national significance while also taking into account its potential environmental consequences.

The purpose of the ESIA Study report is to present relevant and adequate information about the proposed project, which involves constructing an aircraft hangar on a 1.2-hectare plot of land within the Kigali International Airport, and CoE aviation training center on a 4-hectare plot of land outside the airport but partially within the airport buffer zone. According to the report, the project construction and operation will have various beneficial effects, such as job creation, economic growth and revenue generation, support for gender equality, encouragement of tourism and local businesses, technological advancement, attraction of foreign investment and international trade, infrastructure improvement, improved maintenance and protection of aircraft, capacity building, enhancement of the aviation sector's reputation, and increased availability of skilled labor, to mention a few.

Despite the benefits mentioned earlier, the proposed project will also have adverse effects such as loss of biodiversity due to vegetation clearing, increased stormwater runoff, soil erosion and compaction, occupational health and safety concerns, issues with employment and labor, negative impacts on heritage sites, child labor and abuse, gender related impacts, damage to utilities, air and noise pollution, waste generation, accidental spills and discharge, electrical and fire hazards, community health and safety, insecurity, micro-climate modification, increased energy and water consumption, disturbance to existing scenery, traffic congestion, the spread of diseases, bird strike hazards, and the potential impacts of the swimming pool. The proponent shall collaborate with the local administration to respond appropriately to conserve the environment by avoiding activities that may negatively affect the environment.

The proposed project design has integrated measures to mitigate potential negative impacts and comply with all relevant laws, procedures, and environmental regulations. The project design also aims to minimize the environmental impact of the built-up area by adhering to the Rwanda Green Building Minimum Compliance System. Throughout the project's implementation and occupation, sustainable environmental management practices should be maintained to avoid the improper use of natural resources, preserve nature, and ensure the health and safety of everyone involved in the project, including workers, the public, and residents of the area.

A management framework will be instituted during the operation phase of the project to ensure that the management of resources (common) and wastes is carried out according to the guidelines provided within the Environmental and Social Management Framework and in tandem with the requirements of Rwanda Environment Management Authority standards.

An Environmental Audit exercise will be undertaken after the first year of implementation to ensure that recommendations of the EMP developed have been followed and any unforeseen impacts are addressed and adequately mitigated.

9.2 Recommendations

The report insists that the project must adhere to the Management Prescriptions (MPs), but it also suggests that the project be carried out with the suggested countermeasures in place to lessen some of the impacts mentioned above. According to the report, the following recommendations are made:

- Minimize the removal of vegetative cover and carry out revegetation as much as possible.
- Plants and trees will be specified that are native to the local climate, to minimize need for extra irrigation and management.
- Regular maintenance and inspection of the stormwater management features and ensure that they are functioning properly and effectively managing runoff.
- Adhering to proper stormwater management practices during the operational phase of the project.
- Ensure the use of appropriate drainage system and storm water management system such as use of NBS through grasses & trees planting and the use of paving that can let the penetration of storm water in the ground.
- Carry out rainwater harvesting.
- Develop and implement site-specific occupational health and safety (OH&S) Plan.
- Provide H&S orientation training and Personal Protective Equipment (PPE).
- Firefighting equipment such as fire extinguishers and sand buckets should be provided at strategic locations to deal with any incident of fire.
- The facilities should be outfitted with lightning protection and earthing equipment.
- Regularly conduct fire risk assessments and strictly adhere to the established regulations and safety best practices.
- The contractor should hire at maximum unskilled labor and as much skilled labor from the local community, to ensure priority in relation to employment.
- Develop and enforce a code of conduct for workers that outlines expected behavior and interactions with the local community, as well as establish a mechanism for resolving conflicts between workers and the local community.
- Provide separate accommodation facilities and gender sensitive PPE for both women and men, throughout all phases. Provide equal employment opportunities for both genders.
- The contractor should ensure that the hired workforce during the construction period is screened and of eligible age to work, in accordance with national labor laws.
- Sprinkling of water during construction to reduce emission of dust.
- Ensure the use of low-emission aircraft in the hangar and within academy practical training facilities.
- Noise-reducing technologies such as low-noise equipment and machinery should be used to reduce the overall noise generated.
- The project area will also be surrounded by a buffer screen of aluminum sheets and screen meshes to reduce the impact of noise from the project site.
- All non-constructed areas must not be paved.
- Ensure that the project is designed to blend well with the surrounding buildings.
- Ensure High quality and sensitive design of the proposed site plan.
- The Contractor should ensure that the employees on site are aware of the company Spill Prevention, Control and Countermeasure (SPCC) Plan for dealing with spills and leaks.
- A Waste Management Plan (WMP) for future monitoring and audits should be implemented.
- The developer should implement and adhere to the existing KIA hazardous waste management plan.
- Implement sustainable waste management practices, such as reducing waste.
- Generation, recycling, and reusing materials where possible, and properly disposing of hazardous waste.
- Using self-cleaning technologies, such as anti-reflective coatings or hydrophobic surfaces, can reduce the frequency of cleaning and the amount of water required for cleaning.
- Unusable construction waste, such as damaged pipes, formwork, and other construction material, must be disposed of at an approved dumpsite.

- Proper solid waste receptacles and storage containers should be provided in sufficient numbers.
- Ensure the adequacy of the ecosan toilet facilities during construction, as well as that for the wastewater treatment plants during operations.
- Regular cleaning of the construction site and different areas in the facilities to avoid any sanitary diseases.
- The contractor should provide temporary road signs or notices to indicate ongoing works and sensitize the nearby communities about the increased traffic.
- Ensure strategic installation of security cameras within and around the project facilities to deter criminal activities, detect security breaches, and assist in investigations.
- Birds may find the airport the best place to breed, all nesting activities must be discouraged.
- The developer is required to conduct a thorough risk assessment to identify possible hazards that may arise from air traffic, accidents, and collisions during training, as well as any other potential accidents that may occur at the hangar site and during training.

The following requirements of the Rwanda Green building minimum compliance system should also be applied for the establishment of the proposed project facilities:

- Minimize heat gain, improve indoor thermal comfort, and reduce the energy for conditioning the indoor environment through efficient design of building's western façade.
- Provide adequate natural ventilation in all non-air-conditioned building areas, to provide thermally comfortable and healthy spaces for the building occupants.
- Ensure connectivity between the interior and the exterior environment, by providing adequate daylighting.
- Encourage the use of energy efficient lighting to minimize energy consumption from lighting usage while maintaining proper lighting level.
- Encourage the use of energy efficient lifts. Lifts equipped with AC Variable Voltage and Variable Frequency (VVVF) motor drive and sleep mode features.
- Encourage the use of on-site renewable technologies, to reduce the net demand for fossil fuel energy and the environmental impacts associated with its use.
- Encourage use of solar energy for water heating applications in the building, to minimize the environmental impacts associated with the use of fossil fuel energy.
- Encourage sub-metering and continuous monitoring to identify improvement opportunities in building's energy performance.
- Reduce energy consumption during operation of the buildings through efficient air-conditioning system design where required to reduce negative environmental impacts from energy use.
- Reduce potable water demand and uncontrolled storm water run-off through effective rainwater management.
- Reduce the use of potable water by using water efficient fittings.
- Treat wastewater generated on-site, to avoid pollution of ground water and receiving streams through safe disposal, and use treated wastewater, thereby reducing consumption of potable water.
- Promote use of private meters for better control and monitoring of water usage.
- Encourage the adoption of concrete usage practices that are environmentally friendly and sustainable.
- Preserve and enhance greenery to attract biodiversity and reduce heat island effect.
- Encourage adoption of environment friendly practices during building construction
- Use refrigerants with Ozone Depletion Potential (ODP) of zero.
- Use refrigerants with Global Warming Potential (GWP) of less than 50.
- Facilitate segregation of waste at source to encourage reuse or recycling of materials, thereby avoiding waste being sent to landfills. Provide separate bins to collect dry waste (paper, plastic, metals, glass, etc.,) and wet waste (organic), as applicable.

- Minimize heat island effect to reduce negative impact on micro-climate. For metal & concrete roofs use material with a high Solar Reflective Index (SRI) to cover at least 50% of the exposed roof area.
- Provide adequate outdoor fresh air supply, to avoid pollutants affecting indoor air quality.
- Provide good thermal comfort for all developments with air-conditioning systems to promote occupant productivity and well-being. Ensure that air-conditioning systems are designed to allow for cooling load variations due to fluctuations in ambient air temperature and to maintain consistent indoor conditions for thermal comfort.
- Recognize that buildings are designed to control and keep the background noise in occupied spaces at levels appropriate to the intended use of the spaces and confirm to the ambient noise standards.
- Minimize airborne contaminants, mainly from inside sources to promote a healthy indoor environment. Use of low volatile organic compounds (VOC) paints, and low VOC adhesives.
- Vertical greenery systems on the East and West Façade to reduce heat gain in the building.
- Vegetation to cover 50% of the exposed roof area.
- Occupancy sensors for corridors, staircases, toilets, conference rooms and closed cabins.
- Photoelectric sensors to maximize daylighting.
- Sun pipes for natural lighting.
- High frequency ballasts in luminaires.
- Ensure that the building is accessible to differently abled and elderly.

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ANNEXES

Annex 1: Land information

National Land Authority (NLA)

Information Summary on Parcel: **1/03/10/03/1594**

Parcel Address			
UPI:	1/03/10/03/1594	SECTOR:	Nyarugunga
PROVINCE:	Kigali City	CELL:	Rwimbogo
DISTRICT:	Kicukiro	VILLAGE:	Kanogo

The central coordinate: (X=515313.63069578 , Y=4782377.98930000)

This parcel does not have an ongoing transaction

Size in SQM	2493479 sqm
Right Type	Full Ownership
Land Use	Administrative buildings
Remaining Land Lease	<p>Notice: Undefined variable: remaininglease in C:\xampp\htdocs\parcel\app\partner\displayparcel.inc.php on line 195</p> <p style="color: blue;">Approximative valuation values (RwF/SQM)</p> <p>The approximative minimum value is 1854</p> <p style="text-align: center;">and</p> <p>The approximative maximum value is 82229</p>

Notice: Trying to get property 'Photo' of non-object in C:\xampp\htdocs\parcel\app\partner\displayparcel.inc.php on line 223

Notice: Trying to get property 'MaritalStatus' of non-object in C:\xampp\htdocs\parcel\app\partner\displayparcel.inc.php on line 224

Owner of the parcel	
GOVERNMENT OF RWANDA	<input type="button" value="Verify"/>

Information regarding caveat, mortgage and parcel representative

The parcel is represented by: MINISTRY OF ENVIRONMENT

This parcel has: 0 mortgage and 0 caveat(s).

Existing land use : **Administrative buildings**

Land use on the master plan:

- 2483347 sqm is planned for T-Transportation zone - 2483347 sqm
- 8577 sqm is planned for P1-Parks and open spaces zone - 8577 sqm
- 1556 sqm is planned for R1A-Low density residential densification zone - 1556 sqm

Annex 2: Emergency Response Plan (ERP) of the Aircraft hangar Project.

The Kigali International Airport has a well-established emergency response plan in place to handle any unforeseen incidents that may occur during its operations. This plan is designed to provide assistance and support services in a uniform manner, ensuring that all specifications are met.

As emergencies and disasters can happen at any time without warning, it is essential for construction sites to prepare for them to minimize panic and confusion. Therefore, Emergency Response Plans (ERP) will be instituted throughout the proposed project cycle.

To ensure effective emergency management during the project's operational phase, the proponent will adhere to the existing emergency response plan for KIA. The regular operational documents contain information on how the proponent will respond to different incidents that may occur during the project.

The airport emergency plan addresses the following hazards: Aircraft accidents and incidents as follow:

- Terrorism incidents.
- Structural fires, fuel farms and fuel storage area.
- Natural disasters.
- Hazardous material incidents.
- Sabotage, hijack and unlawful interference with operation.
- power failure in movement area lighting.

Since the proposed project is likely to encounter some of these hazards during its operation phase, it can only be successful if it adheres to the existing emergency plan for KIA. Therefore, the project must be harmonized with the emergency response plan to ensure effective emergency management.

Emergency Response Plan Objectives

The aim of the emergency response plan is to ensure that personnel are capable of coping with any emergency situation. The primary concern is for the safety of workers, visitors, contractors and the community. Vital records, property and other assets should also be protected.

The proponent must ensure that these procedures are kept in a prominent position and that all personnel are made aware of the contents. It is also essential that this document is amended when there are site or personnel changes that impact on the procedures herein.

All personnel must make themselves aware of the location of all emergency alarms, exits and fire appliances within or near their work area and location of the external Safe Assembly Areas.

The effectiveness of these procedures depends on the willingness of all personnel to make themselves aware of the immediate actions they must take in an emergency so that they are capable of acting promptly, calmly and efficiently.

The following elements of a conventional emergency response plan are recommended as summarized in table below.

Emergency Response Plan

Position or Description	Responsibilities for Aircraft Hangar Emergency Response
Airport Manager	<ul style="list-style-type: none"> ▪ Serve as Emergency Coordinator. ▪ Assume Incident Command responsibility for all response and recovery operations, as appropriate. ▪ Establish, promulgate, coordinate, maintain, and implement the Airport Emergency Plan (AEP). ▪ Monitor Police and Fire radio for updates in case of fire situation as well as provide appropriate alerts and notifications. Coordinate the closing of the airport when necessary and initiate the dissemination of relevant safety-related information to aviation users. ▪ Notify appropriate KIA personnel in case of emergency
DAir Carrier/Aircraft Operator	<ul style="list-style-type: none"> ▪ Provide full details of aircraft-related information, as appropriate, to include number of persons, fuel, and dangerous goods on board. ▪ Coordinate transportation, accommodations, and other arrangements for uninjured passengers. ▪ Coordinate use of air carrier/aircraft personnel and other supplies and equipment for all types of emergencies occurring at the aircraft hangar.
Akagera Aviation Fire Chief/ Department	<ul style="list-style-type: none"> ▪ Manage and direct firefighting and rescue operations.
Akagera Aviation Fire Chief/ Department	<ul style="list-style-type: none"> ▪ Manage and direct firefighting and rescue operations. ▪ Direct search and rescue or hazardous materials response. ▪ Coordinate mutual aid resources through Incident command System. ▪ Assist with search and rescue or evacuations. Assume Incident Command as appropriate.
Airport Police	<ul style="list-style-type: none"> ▪ Manage and direct police operations.
Chief/Department	<ul style="list-style-type: none"> ▪ Assist with traffic control and scene security. ▪ Assist with search and rescue or evacuations. ▪ Respond as needed for activities involving crowds or assemblies of people. ▪ Respond to bomb threats or acts of terrorism. ▪ Assume Incident Command as appropriate. ▪ Respond to the scene with all appropriate personnel,

	<p>protective equipment, secure the area, then ascertain the nature and severity of the threat.</p> <ul style="list-style-type: none"> ▪ Establish primary and secondary perimeters after a thorough search and assessment has been conducted. ▪ In the event of a biological/chemical release it may become necessary to secure and evaluate a large downwind area in order to prevent further potential civil casualties.
Akagera aviation emergency management officer	<ul style="list-style-type: none"> ▪ Assist Aircraft Hangar with obtaining all resources offered by the state or board governments. ▪ Assist the county in obtaining any state or federal government resources that may be needed as a result of an emergency situation.
Kanombe Military Hospital	<ul style="list-style-type: none"> ▪ Provide emergency medical services to the aircraft hangar during emergency conditions to include triage, stabilization, first aid, medical care, and transportation of the injured. ▪ Coordinate planning, response, and recovery efforts with hospitals, fire and police departments, airport operator, etc. Coordinate the hospital disaster plan with the airport and community Emergency Operations Plan (EOP).
Akagera Aviation Operators	<ul style="list-style-type: none"> ▪ Coordinate the use of their available equipment and supplies.
County security guard	<ul style="list-style-type: none"> ▪ Provide primary law enforcement for off-airport events. Coordinate scene security. ▪ Assist with investigations. ▪ Assist with search and rescue efforts.
Public Works section	<ul style="list-style-type: none"> ▪ Provide primary law enforcement for off-airport events. Coordinate scene security. ▪ Assist with investigations. ▪ Assist with search and rescue efforts.

Activation of the Aircraft hangar Response Plan:

The plan will be activated if unit aircraft are involved in an emergency situation. An emergency situation exists if any of the following criteria are met:

- The aircrew does not answer a status check from Communications for ten minutes.
- The aircrew is more than 30 minutes past due on cross country, maintenance, or administrative type flight.
- Aircraft Emergency Locator Beacon is activated (this will be advised by an air traffic control or federal search and rescue source)
- Aircrew advises via law enforcement or aviation radio that they are in an emergency situation.
- Police call advises agency aircraft is in an emergency situation (and unable to confirm otherwise with aircrew).

Safety Officer:

During the initial stages of the incident response, the Safety Officer will concentrate his efforts on locating the missing aircraft and assisting in facilitating any emergency medical assistance needed by the flight crew. The Safety Officer will take direction from the Aviation Unit Commander and Chief Pilot in order to fill the operational needs of the search and response. If the Safety Officer arrives at the command post before the Aviation Commander or Chief Pilot, he will assume command of the operation until they arrive. Once the aircraft has been located and the crew tended to, the Safety Officer will assist the Chief Pilot in the incident investigation at the scene. If necessary, the Aviation Commander may recall the Safety Officer for other tasks (for family contact, to go to the hospital with the crew, etc.). After the aircraft incident, the Safety Officer will complete a safety report on the incident, possible causes and/or contributing factors and proposed response to prevent a reoccurrence. The report will be completed as soon as possible, but the Safety Officer should consult with other accident investigation experts before documenting possible causes of the incident. The report should be factual and not speculative, aimed at enhancing safety, not placing blame.

Chief Mechanic

The Chief Mechanic's knowledge of the aircraft components and systems make him an extremely valuable asset in any operation following an aircraft incident. During the search, the Chief Mechanic will take fuel samples from the fuel storage tanks and the other aircraft to ensure any possible contamination will not cause further loss of equipment or injury. He will then be available to the Division Commander for any operational tasks needing to be completed. The Chief Mechanic may be utilized as a crew member (Observer) on the search aircraft. The Chief Mechanic will respond to the incident site with any equipment that may be required. The Chief Mechanic will assist the Chief Pilot in making the aircraft 'safe' (engine/power secured) and then in the initial investigation that follows. In the event of an aircraft incident, the vast amount of work needed to find the aircraft, care for the crew and conduct a follow-up investigation will be best facilitated by having as many Aviation staff members on the job as possible. Responding Aviation staff members not already assigned a task by this response plan will first go to the command post at the Aviation Unit office and report to the Aviation Commander (or designee).

In order to ensure public health and safety, and to prevent accidents or emergency situations at construction, operation or decommissioning phases, the following action plan shall be incorporated in the project cycle.

Health, Safety and Accident Prevention Plan for the construction of Aircraft hangar

Issue	Specific measures	Responsibility
Project design	<ul style="list-style-type: none"> ▪ Incorporation of environmental, health and safety (EHS) measures in the process. 	<ul style="list-style-type: none"> ▪ Project manager ▪ Developer
Organization and cleanliness at the workstation	<ul style="list-style-type: none"> ▪ Keep materials in correct place. ▪ Maintain cleanliness at the workstation. 	<ul style="list-style-type: none"> ▪ Project manager
Fire safety	<ul style="list-style-type: none"> ▪ No storage of inflammables at the site ▪ Fire safety awareness ▪ Keep firefighting facilities at the site. ▪ Safe handling of fire ▪ Ensure functionality of fire detection and suppression system 	<ul style="list-style-type: none"> • Facility manager
Accident prevention	<ul style="list-style-type: none"> ▪ Safe handling of tools and 	<ul style="list-style-type: none"> ▪ Worker's facility

	machinery <ul style="list-style-type: none"> ▪ Use of appropriate PPE ▪ Engagement of qualified personnel 	manager
Waste disposal	<ul style="list-style-type: none"> ▪ Provision of adequate waste disposal facilities at the facility ▪ Engagement of REMA licensed waste disposal company ▪ Separation, re-use and recycling of packaging materials ▪ Proper maintenance and connection of sewerage/drainage system to ensure that there are no leakages 	<ul style="list-style-type: none"> ▪ Contracted waste disposal company facility manager
Tools and machinery safety	<ul style="list-style-type: none"> ▪ Use of tools and machines for designated job ▪ Regular servicing of machinery ▪ Proper storage and handling of tools. 	<ul style="list-style-type: none"> ▪ Facility manager
Emergency preparedness	<ul style="list-style-type: none"> ▪ Keeping passages clear ▪ Marking emergency exits ▪ Training staff in emergency preparedness and response ▪ Keeping a well-equipped first aid kit on site 	<ul style="list-style-type: none"> ▪ Facility manager
Site security	<ul style="list-style-type: none"> ▪ 24-hour security at site ▪ Control of visitor entry into the hangar 	<ul style="list-style-type: none"> ▪ Security company

Annex 3: STAKEHOLDER GRIEVANCE LOG**GRIEVANCE RECORD FORMAT**

To be completed by AKAGERA AVIATION LTD personnel (if grievance being submitted in person) or person submitting complaint.

Grievance Record			
Reference No: (for official use)			
Anonymous:	Yes	No	
Full Name:			
Contact Information: Please mark how you wish to be contacted. (Letter, telephone, e-mail).		Address/village/traditional authority and ward: Telephone: E-mail:	
Preferred Language for communication			
Description of Incident or Grievance:		What happened? Where did it happen? Who did it happen to? What is the result of the problem?	
Date of Incident/Grievance			
One time incident/grievance (date _____)			

<p>Happened more than once. (How many times? _____)</p> <p>On-going (currently experiencing problem)</p>
<p>What would you like to see happen to resolve the problem?</p>
<p>Additional Comments:</p>

GRIEVANCE RECORD – TO BE USED AS PART OF THE DATABASE

Grievance Record			
Grievance Number:	Date Submitted:	Target Date for Resolution:	
Name:			
Address and Contact Details			
Grievance Received By:			
Name of Grievance Coordinator:			
Description of Grievance:			
Assessment of Grievance Level:		Notification to CEO or other senior management?	Y/N
Actions to Resolve Grievance			
Delegation to:			
Action	Who	When	Completed
Response/Resolution:			
Strategy to Communicate Response:			
Sign-Off:			
Date:			
Conclusion			
Is complainant satisfied?	Y/N	Comments from Grievance Coordinator	
Grievance Closed?	Y/N	Grievance Resubmitted?	Y/N
Signature of CEO:		Date:	
Date:		New Grievance Number:	

Annex 4: Minutes of the high-level stakeholder meeting**STAKEHOLDER CONSULTATIONS MEETING FOR AIRCRAFT HANGAR AND CoE AVIATION TRAINING CENTER PROJECT****Meeting Proceedings****Opening**

Venue: Kigali international airport

Date: 08th, May 2023

Time: 10:00 am – 12:00 pm

Attendants	Number of participants
Women	4
Men	12

Meeting agenda

- Opening remarks
- Rationale for Stakeholder Consultations/ Stakeholder Engagement and Information Disclosure
- Project Description/ Description of the Project Environment
- Impacts Evaluation
- Views and Opinions/ Issues raised.
- Way forward on Stakeholder Consultations
- Closing remarks.

Rationale

Effective stakeholder engagement is crucial for ensuring the environmental and social sustainability of projects and enhancing their acceptance and successful implementation. This engagement is required by both the National EIA guidelines and The AfDB Operational Safeguard 1: Environmental and social assessment for carrying out an effective Environmental and Social Impact Assessment of proposed projects. The consultation process is free and transparent, and all views and opinions are discussed to contribute to the ESIA process and the sustainable development of the project.

The stakeholder engagement process is an inclusive one, initiated early in the project development process and conducted throughout the project life cycle. This process is an integral part of early project decisions, as well as the assessment, management, and monitoring of the project's environmental and social risks and impacts. By incorporating stakeholder input, project design can be optimized, and potential negative impacts can be mitigated, resulting in a more sustainable and socially responsible outcome.

The ESIA process requires the consideration of views and inputs from all stakeholders and relevant experts. During the consultative meeting for the aviation hangar and academy training center project, the consultant presented and disclosed anticipated issues with the project's construction, operation, and decommissioning. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.

At the beginning of the meeting, Akagera Aviation Ltd expressed their gratitude to all participants for their time and willingness to contribute to the success of the proposed project. The opening remarks were followed by a presentation from the consultant team.

Project Description

- Developer and project background
- Project objectives
- Project cost
- Project components
- The connection between the proposed hangar and Kigali International Airport.
- Current condition at the airport site
- Project phasing and activities

Brief description on the project environment

positive anticipated impacts

Impact evaluation/ negative anticipated impacts

The floor was then opened for discussions whereby views, opinions and concerns from stakeholders were collected and discussed.

No	Views and opinions/ concerns	Response provided
1	The proposed project is a fantastic project which will benefit the aviation industry as well as the country. Could you provide more specific details regarding the proposed project's phase-wise timeline and the anticipated implementation planning?	Prior to commencing the implementation of the proposed project, several prerequisite procedures need to be carried out. Notably, the Environmental and Social Impact Assessment (ESIA) is being conducted concurrently with the feasibility study. The target timeline for executing the project is set for 2024, and it is expected that within two years of its launch, the project will be operational. It is worth mentioning that the training activities will persist until the completion of the center of excellence.
2	I'd like to know if the mandatory internal training programs that all companies operating in KIA have will be consolidated into the proposed academy, or if they will remain separate.	As part of the ATL establishment, Akagera Aviation Ltd has been designated as the training provider for aviation in the country. Currently, they offer flight operation training, but over the next decade, they will expand to provide all types of training.
3	Who will be managing the proposed project?	Akagera aviation Ltd.
4	What are the operational impacts that the assessment has identified as likely to occur on a daily basis, and what steps will be taken to manage and mitigate those impacts?	During the presentation, the anticipated impacts were discussed, and we would like to hear your opinions and comments regarding these impacts. Some of the impacts mentioned were bird strikes, air and noise pollution, fire and electrical hazards, waste generation, accidental spills, insecurity, micro-climate modification, and disturbance to the natural environment.

		In the ESIA perspective, all project components, including those that will be linked to the existing KIA, were considered. For example, the report recommended the construction of a wastewater treatment plant for the proposed academy since it is not within the KIA.
5	Can you clarify whether the fire protection system being proposed for the new project will be integrated with the existing firefighting and brigade at KIA, or will it be a separate system not connected to the airport?	It is not intended to have a separate fire protection system for the proposed project. Instead, the plan is to install automatic firefighting systems on the site, which will be supported by the existing KIA fire brigade in case the system is unable to effectively manage a fire incident.
6	The ESIA should showcase the Rwanda Green Building Minimum Compliance System, which is mandatory for new educational structures and a recommended approach, as well as the project's alignment with the SDGs. Additionally, detail the effects of the project on the neighboring communities.	The study has taken into account the requirements of the Rwanda Green Building Minimum Compliance System, and as a result, suggests environmentally friendly building practices and technology that the developer should incorporate into the design.
7	It is important to consider how the management of birdlife and wildlife will be approached at the construction site, as construction areas typically attract birds.	The effective management of birds is a vital aspect for airport facilities. The potential threat of bird strike hazards is currently being evaluated, and various measures to mitigate this risk have been suggested. It is recommended that the management methods already in place at the present KIA should be shared and incorporated into these mitigation measures.
8	In the assessment, it is essential to give careful attention to the management of soil erosion during construction and dust control during aircraft takeoff and landing.	<p>The study proposes several measures to mitigate soil erosion, including the implementation of silt fences, retaining structures, and other appropriate techniques.</p> <p>The study has given consideration to the issue of dust generation during aircraft takeoff and landing and will suggest several measures for control and mitigation.</p>
9	Will the project facilities be dependent on the power and water supply of the existing KIA, or will they have their own separate supply?	<p>The project has examined two options for its power and water supply. The first option involves connecting both the hangar and academy to the existing water tank and substation at KIA for their respective water and power needs. The second option involves connecting only the hangar to KIA's water tank and substation, while the academy connects directly to the public municipal distribution system (REG for power and WASAC for water).</p> <p>However, it is recommended that the most cost-effective option would be to connect the hangar to the existing water</p>

		tank for water needs and the existing substation for power needs, while the academy connects to the public electricity distribution system (REG) and water distribution system (WASAC).
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Recommendation

- The emergency response procedures at the proposed project will be aligned with the existing emergency response plan at Kigali International Airport.
- Once the report is completed, it will be shared with all key stakeholders for their input and comments to ensure the sustainability and success of the project.
- During the assessment, safety, reliability, and security will be the main focus to ensure a safe and successful operation.
- As the existing runway will be utilized by both commercial and training aircraft, potential risks of air traffic and collisions arise. As a result, it is advisable for all parties and agencies involved at the airport to work together to develop a thorough safety risk assessment in this matter.

Way-forward

- Stakeholder Engagement is going to be a continuous process throughout the life cycle of the Kigali FSTP Project.
- Stakeholders will share additional inputs and comments on the draft ESIA Report.
- The consultant will provide a description on how costs in the ESMP were estimated.

Closing remarks

The representative from the developer akagera aviation ltd, appreciated all participants for their active engagement in the meeting.

Minutes prepared by: Aline Uwera and Patience Uwera/ **ED&P Associate consultants.**

Kigali, 08th May 2023.

Annex 5: Minutes of the second High-level stakeholder consultation**SECOND STAKEHOLDER CONSULTATIVE MEETING FOR THE AIRCRAFT HANGAR AND CENTER OF EXCELLENCE AVIATION TRAINING CENTER PROJECT****Meeting Proceedings****Opening**Date: Monday 15th May 2023

Time: 2:00 pm- 5:00 pm

Location: Aviation Travel and Logistics Holding Ltd

Attendants	Number of participants
Women	4
Men	8

Meeting agenda

1. Introduction session and Opening remarks
2. Presentation of the draft ESIA project.
3. Collection of opinions/views and concerns from the stakeholders
4. Closing remarks

1. Introduction session.

The meeting started with a short introduction of all participants followed by opening remarks by Joseph Ndayishimiye director of Operations at Akagera aviation ltd thanking and welcoming all the stakeholders of the project.

2. Presentation the draft ESIA report of the project

The environmental specialist provided an overview of the various components included in the Environmental and Social Impact Assessment (ESIA), which encompass the following sections:

- Introduction
- Project Description
- Description of the project Environment
- Policy, Legal and Institutional Arrangements
- Alternatives analysis
- Impacts Evaluation
- ESMP
- Stakeholder Engagement Plan
- Conclusions & recommendations

3. Views and opinions/ Issues raised

The floor was then opened for discussions whereby views, opinions, and concerns from stakeholders were raised and discussed.

Some key concerns and issues raised through discussion were then clarified.

No	Views and opinions/ concerns	Response provided
1	How will the issue of radiation reflection, which could potentially cause disruptions due to the presence of solar panels on the roof of the facilities, be addressed to prevent harm to the pilot's eyes and lead to accidents?	While the adoption of renewable energy is highly desirable, it is crucial to ensure that the installation of solar panels does not interfere with the pilot's vision due to any reflections they might produce. Therefore, additional studies will be conducted to guarantee the use of solar panels in a way that do not pose a problem.
2	With different activities being undertaken in facilities there may be risk of fire hazards, how would it be dealt with?	A fire suppression system has been proposed for both the aircraft hangar and the center of excellence aviation training center to address fire incidents. This system involves the release of fire foam and water, which will effectively suppress and prevent the spread of fires. The facilities will also be equipped with firefighting equipment such as fire extinguishers and others.
3	In order to prevent any form of harassment, how will the design of the center of excellence ensure a safe environment for both girls and boys?	The design has made sure to provide different accommodations for boys and girls at the center of excellence aviation training center.
4	Given the scale of the project and the heightened security requirements at the project location, how will security measures and the management of facilities be effectively addressed and handled?	As the aircraft hangar is situated within Kigali International Airport and the center of excellence aviation training center is in close proximity with access to the airport, the security arrangements for both facilities will be integrated into the overall security plan of the airport.
5	Considering the critical requirement for continuous power supply at the aircraft hangar and the center of excellence aviation training center, how will this need be effectively addressed and ensured without any interruptions?	To ensure a reliable power supply for the aircraft hangar and the center of excellence aviation training center, both facilities will be connected to the substation of Kigali International Airport, where a backup generator is in place in case of a power cut.
6	How will the continuous supply of water be guaranteed at the aircraft hangar and the center of excellence aviation training center, given the critical importance of this resource for their operations?	In order to maintain a consistent water supply, the aircraft hangar will be linked to the current water supply system at Kigali International Airport or nearby WASAC tanks. Similarly, the center of excellence aviation training center will be connected to the public water supply system in the surrounding region, ensuring uninterrupted access to water for both facilities.

7	In order to attain its objective of becoming a prestigious aviation school, how will the center of excellence aviation training center ensure the quality and comprehensiveness of the qualifications it will provide?	To establish itself as a highly reputable institution, the center of excellence aviation training center will possess ample training facilities. Additionally, the school will form partnerships with esteemed higher learning institutions like Coventry University to deliver diverse aviation courses to trainees, thereby solidifying its position as a provider of top-notch qualifications in the aviation sector.
8	When it comes to stormwater management, how will the proposed facilities ensure proper handling of the drainage system to prevent any mismanagement that may result in potential disasters?	As a recommended approach, it is proposed that the upcoming facilities be connected to the existing drainage system in the vicinity of Kigali International Airport (KIA). This is due to the well-designed nature of the current drainage system, which effectively channels water down to the Rubilizi wetland. Therefore, establishing a connection to this system is considered a preferable solution.
9	Considering the inevitability of noise generation from the operations of the aircraft hangar and the center of excellence aviation training center, which are located in close proximity to flight activities, how will measures be implemented to mitigate the potential impacts of noise?	Akagera Aviation stated that the aircraft used for pilot training are expected to have minimal noise emissions due to their small size. Furthermore, as part of their ambitious objective, they plan to acquire aircraft models that produce reduced or no noise at all.

Way forward

1. Finalize and share the final ESIA report with relevant stakeholders.
2. Effective project management of the aircraft hangar and CoE aviation training center requires collaborative efforts among all institutions involved, with clearly defined roles and responsibilities for each institution. This collaborative approach is crucial for the success of the project.

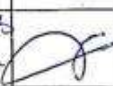






Kigali, 15th May 2023








Annex 6: Attendance lists of stakeholder consultations**Public consultation attendance list**


N0	NAMES	INSTITUTION	POSITION
1	Patrick Nkulikiyimfura	Akagera Aviation	Managing Director
2	Matt Twahirwa	Akagera Aviation	Flight Instructor
3	Joseph Ndayishimiye	Akagera Aviation	Director, Flight Operations& Training
4	Egide Mbane	Akagera Aviation	Helicopter Pilot
5	Kellen Kayesu	Akagera Aviation	Executive Assistant
6	Faustin Muhunde	Akagera Aviation	Manager Quality Safety
7	Joseph Murinda	Akagera Aviation	Engineer
8	Uwamahoro Genevieve	Nyarugunga Sector	Executive Secretary
10	Habyarimana Jean Callixte	Nyarugunga Sector	Land manager & Infrastructure officer
11	Cyineza Bora Josiane	Nyarugunga Sector	Social Affairs Officer
12	Habonimana Pascal	Nyarugunga Sector	Community health and Sanitation Officer
15	Sebarindwi Sylvestre	Kamashashi Cell	Executive Secretary
16	Bamurange Beatrice	Kamashashi Cell	SEDO
17	Ntakirutimana Jefferson	Rwimbogo Cell	Executive Secretary
18	Mutabazi Augustin	Rwimbogo Cell	SEDO
19	Umurerwa Agnes	Rwimbogo Citizen	Local Citizen
20	Sekigera Nduwayo Mathias	Rwimbogo Citizen	Local Citizen
21	Munyengabe Tharcisse	Rwimbogo Citizen	Local Citizen
22	Mukantwari Stephanie	Rwimbogo Citizen	Local Citizen
23	Uwera Annah	Rubirizi Citizen	Local Citizen
24	Nkunzi Nicolas	Rubirizi Citizen	Local Citizen
25	Nyiraneza Philomene	Rubirizi Citizen	Local Citizen
26	Irafasha Felicien	Kamashashi Citizen	Local Citizen
27	Kayiranga Patrick	Kamashashi Citizen	Local Citizen

28	Rwigema Francine	Kamashashi Citizen	Local citizen
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First High-level stakeholder consultation attendance list

Stakeholder Consultation Meeting Attendance Sheet							
Project: AVIATION HANGAR AND ACADEMY TRAINING CENTER PROJECT						Date: 8 th May 2023	
Venue: KIGALI INTERNATIONAL AIRPORT						Time: 10:00 am -	
N°	Names	Gender	Organization/ Sector	Position	Phone number	Email address	Signature
1.	Nicholas Ngenzi	M	EDP	Senior Technical Advisor	0788506105	nngenzi@kya.com	
2.	Uwera Patricia	F	EDP	Associate consultant	078964800	uwepatricia2@gmail.com	
3.	Uwera Aline	F	EDP	Associate Consultant	0789615207	Uweraaline8@gmail.com	
4.	Emmanuel UWIZEMANA	M	RDB	Future Skills Analyst	0788788389	emmanuel.uwizemana@rdb.rw	
5.	Elise Rusingizangukw	F	ATL	CHRO	0788381152	elise.rusingizangukw@atl.rw	
6.	Joseph Nanyishimwe	M	ACAFS/AVIATION	DIRECTOR FLIGHT OPS & TRAINING	0788545047	JOSEPH.NANYISHIMWE@ACAFS.COM	
7.	Bahati Alixand	M	RCAA/AVIATION	MANAGER AERODROME AND GROUND HANDLING	0724123081	abahati@caa.gov.rw	

8.							
9.	KAREGAYA Felixphor	M	RAC	Civil Engineer	078837074	karegaya@rac.co.rw	
10.	David NYONZIZA	M	RAC	M/EIA	0724123 658	dnyonziza@rac.co.rw	
11.	LAMBERT BAGANINGA	M	RWANDAIN	SUPERVISOR LINE MAINT.	0788686245	lambert.baganinga@rwandan.com	
12.	MUGUMU ALEX	M	RWANDAIN	SENIOR OPERATIONS MTH	0788357272	alex.mugumu@rwandan.com	
13.	Eva F. Nishimwe	F	ATH	Senior Aeronautical Engineer	0732514708	eva.nishimwe@ath.rw	
14.	Emmanuel Gacinya	M	RAC	Director of Airports Operations	0724123014	egacinya@rac.co.rw	
15.	KABAGEMA J. Rine	M	Ecoban	Associate Consultant	0744306354	kabagema@ecoban.com	

16.	MUKIRWA FIDELE	M	REMA	EIA Monitoring officer	0783204702	Amukirwa@rema.gov.rw	
17.							
18.							

Second High-level stakeholder consultation attendance list



[Aviation Academy- Stakeholders' Consultation Meeting-ESIA review and validation]

[Venue: ATL Boardroom, Date: 15th May 2022]:

ATTENDANCE LIST

N°	Name	Organization	Email	Phone number	Signature
1.	Ines Uwimbabazi	ATL	ines.uwimbabazi@atl.rw	0788417422	
2.	NKANGURA Loick Dirin	Eco-design & Protection	loickdirin@gmail.com	0784664673	
3.	MUGENI Carmen	Eco-design & protection	mugenicarmen@gmail.com	0782125182	
4.	Uwera Aline	Eco-design & protection	Uweraaline58@gmail.com	078915207	
5.	Bahati Alexander	RCAA	abahati@caa.gov.rw	0724123881	
6.	Emmanuel UWIZYIMANA	RDB	emmanuel.uwizyimana@rdb.rw	0788788389	
7.	Rusinganzukwe Elise	ATL	eliserusinganzukwe@atl.rw	0788381152	
8.	JOSEPH NDOMUSHIMWE	Kubanza Aviation	JOSEPH.NDOMUSHIMWE@KUBANZA-AVIATION.COM	0788845847	
9.	Kubanza Jilene	Eco-design & Protection	kubanzajilene@gmail.com	0788306354	



Nº	Name	Organization	Email	Phone number	Signature
10.	Patience Uwera	EDP	uwera.patience.2@gmail.com	0781964000	
11.	Jean Marie Adizeye	MININFRA	jeanmarie.adizeye@mininfra.gov.rw	0788750233	
12.	Richard Ngenzihaye	EDP	jeanmarie.adizeye@mininfra.gov.rw jeanmarie.adizeye@gmail.com	0788306105	