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AFRICAN DEVELOPMENT BANK

GROUP

PROJECT : SHARM EL-SHEIKH AIRPORT PROJECT

COUNTRY : EGYPT

SUMMARY OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

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Environmental and Social Impact Assessment (ESIA)

Summary

Project title	:	**SHARM EL-SHEIKH AIRPORT PROJECT**
Country	:	**EGYPT**
Project reference	:	**P-EG-DA0-001**

1. INTRODUCTION

In accordance with the construction of the new terminal building (No.3) in the Sharm El-Sheikh Airport, an environmental and social assessment of the project was carried out. This executive summary provides the main conclusions of this environmental and social assessment and the main actions to undertake as per the Environmental and Social Management Plan of this project.

The environmental and social assessment was carried out according to the policies and procedures of the Bank and the operational policies of the World Bank.

2. PROJECT DESCRIPTION AND JUSTIFICATION

2.1. PROJECT DESCRIPTION

The airport is located about 650 km south east of Cairo in the southern region of the Sinai Peninsula. It is approximately 23 km north east of the city of Sharm El-Sheikh (SES). The project consists of constructing a new terminal building (No.3) and a third runway. These are proposed to be located on the other side of el Salam road, the main feeder road into the existing facilities. The new terminal building shall occupy an area (land area) of about 183,000 m^2 and its construction is due to commence in 2015

The associated airfield works to be financed by the AfDB are designed to contain the following:

- Construction of airfield works, including a new 3.6 km runway, taxiway system, aprons, service roads, and ancillary buildings.
- Construction of a control tower with all associated navigation systems.

The airfield and tower will support the new terminal building expected to have a total capacity of 10 million passengers annually. The Egyptian Airports Company has set an objective to have this terminal in full operation by 2015.

Figure 1: Project Location

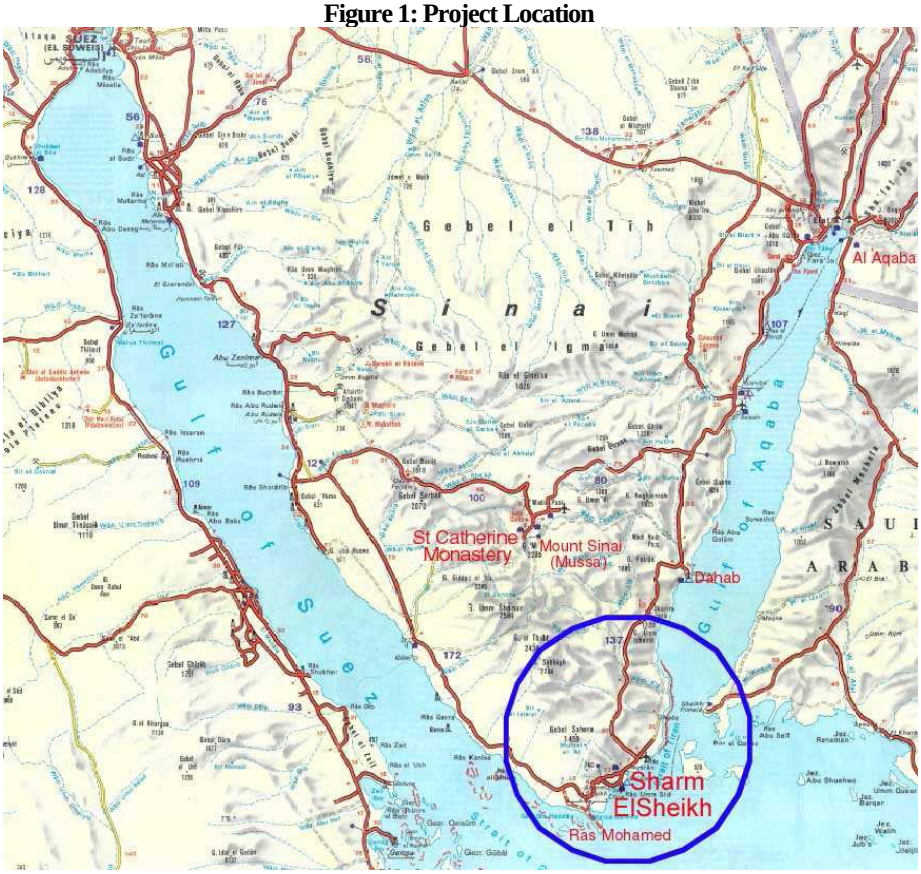

Figure 2: Recent satellite image for Sharm El-Sheikh Airport site location and the position of proposed runway (solid straight line) and the tower (in the triangle).

The project's passenger building will be constructed on the estimated area of 100,000 square meters. It is expected that the new airport receives the number of 10 million passengers annually, in addition to the current number of 8.0 million passengers a year. Therefore, the total number of passengers expected to use Sharm el-Sheikh International Airport's by 2030 is estimated at 18 million passengers annually.

The main utility services related to the airport are given below:

- Electric energy will be provided to new terminal through national grid lines feeding the existing facilities. The national electricity companies confirmed the availability of sufficient supply by the time of commencement of operation of the new terminal;
- The water supply system will be combined for domestic needs and the fire fighting systems. The supply will be provided through the current pipes feeding the existing facilities. The source of the supply is desalination plants in Sharm el-Sheikh.
- The waste water collection system will be based on a separate system. A waste water processing station will be located to the West of the airport within the airport zone.
- The airport drainage will be carried out through runoff pipes towards the nearest thalwegs by using pits, canals and pipes, as required. The drainage of runoffs is designed in such a way that the natural water flows are preserved as far as possible.

2.2. LAND ACQUISITION AND RESETTLEMENT

Regarding resettlement activities, there is no foreseen resettlement as the land has already been selected and handed to the project authority without having any disputes. The land is fenced and is owned by the state and no one lives there. Therefore, there is no need to trigger the Egyptian law 577/54 for expropriation or the Bank's Involuntary Resettlement Procedures.

2.3. PROJECT JUSTIFICATION

Utilisation of the current facilities in Sharm el-Sheikh has reached full capacity in 2010, and will therefore not be able to handle any growth in Air Passenger traffic. This necessitated the need for the new project. The capacity of the new project was designed based on Air Passenger traffic forecasts.

The expected benefits of the project are following;

- Environmental benefits
  - Enhancing the conditions of infrastructure, sewage system and potable water supplies;
  - Reducing fires that took place due to having solid wastes without having
  - suitable containers

- Benefits for health
  - Reduction of epidemic diseases results from congestion
  - Provide potable water and appropriate sewage system that will safe people from unacceptable odours from the sewage.

- Socio-economic benefits
  - Providing large numbers of job opportunities during the construction and during operation;
  - Providing indirect job opportunities in supporting industries and tourism activities
  - Increasing number of tourists will consequently increase the national and local income
  - Reduction of congestion inside the airport.

- Reduction in airport delays
- Improving comfort of travellers using new facilities (more space, less noise, etc)
- Increasing investments in the city and Egypt overall

3. STATUTORY, LEGAL AND ADMINISTRATIVE FRAMEWORK

3.1 LEGISLATIVE FRAMEWORK

The law requires that any new project should comply with all the relevant articles pertinent to environmental attributes, which could be impacted by project activities.

Law 4/1994 and its executive regulations set the overall framework for environmental protection in Egypt. According to this law, an environmental Social impact assessment (ESIA) should be prepared with the application for the license of a project.

The law divides the types of projects into three lists: A, B, and C list projects. The development project of new terminal building and runway at SES is a C-list project, which is comparable to a "Category A" World Bank project. According to the Egyptian Environmental Affairs Agency (EEAA), Guidelines for Egyptian Environmental Social Impact Assessment, the ESIA of the project is being submitted to the competent administrative authority, the Ministry of Civil Aviation.

Table 1: Related Egyptian Environmental Laws

Environmental Issues	Laws
Noise	Article 42 of Law 4, and article 44 of its executive regulations on maximum allowable limits for sound intensity.
Air Quality	Article 40 of Law 4 and article 42 of its executive regulations maximum allowable limits for the concentration of pollutants resulting from burning of fuels. Article 36 of Laws and article 37 of its executive regulations on maximum allowable limits for pollutants in exhaust gases Article 35 of Law 4 and article 34 of its executive regulations on maximum allowable limits for ambient air pollutants.
Waste Water	Law No. 93/1962 on standards for the discharge wastewater to the sewerage network and its Ministerial Decree 44/ 2000.
Hazardous Material	Article 32 of Law 4 on handling of hazardous materials.
Waste Management	Law No. 38/1967 amended by Law No. 31/1976, and Law 4 on public cleanliness and collection and disposal of solid Waste.

3.2 INSTITUTIONAL FRAMEWORK

The Egyptian Environmental Affairs Agency (EEAA) was established, as a result of this Policy the Environmental Affairs Law (Law No. 4 /1994), to be the competent national authority in environment management. Under the umbrella of EEAA another identity was formed, this is the National Coastal Zone Management Committee (CZM). This committee is involved in managing the project zone.

Other institutions/ entities concerned by the construction of the airport, include the Tourism Development Authority (TDA). The main functions of TDA are to serve as the governmental authority responsible for tourism districts and resorts development, complying with the state general policies and its economic plans. It is noticed that TDA has the full control on using the lands which it considered tourism districts, this control is not coming only from the Law No. 7/1991 and the Presidential Decree No. 374/1991, but also there is the Law No. 2 for the year 1973, this Law gives the Ministry of Tourism

the full authority in managing all tourism districts and profiteering it. Concerning subject project there are a Presidential Decree (No. 445 for the year 1992), which considers coastal zone of South Sinai on Gulf of Aqaba as a tourism district. TDA, according to this Presidential Decree, is considered as the landlord of these areas.

Egyptian airport company (EAC) will supervise all activities related to the Environmental Management Plans (EMP), and carry out supervision of the implementation of the mitigation measures. The EAC will be able to carry out most of these duties internally but it is possible that some will require technical or physical inputs beyond their normal scope of activities. These will be the responsibility of Contractor(s), supervised by the EAC.

3.3 LIMITATIONS OF THE STATUTORY AND INSTITUTIONAL FRAMEWORK

The evaluation of the statutory and institutional context of the management of natural resources and environment protection, in relation to the airport sector, reveals that Egypt has developed reasonably adequate specific norms regulating sound emissions. However, coordination between the major utility providers and such types of project doesn't seem to have clear regulations governing this relationships.

4. DESCRIPTION OF THE PROJECT ENVIRONMENT

4.1 CLIMATIC CHARACTERISTICS

The meteorological conditions in the area surrounding the Sharm El-Sheikh airport are dominated by the Bay of Aqaba as well as the mountains of Sinai. A very predominant northerly wind is prevailing in the area. During the summer season the weather is dry and hot with prevailing winds from north and north-northeast. During winter the wind is frequently also blowing from southerly directions. In the spring, strong dusty winds may occur bringing high concentrations of dust. During autumn season it may occasionally rain heavily.

4.2 GEOLOGY AND TOPOGRAPHY

The study area (SES Airport) lies along the coast of the Gulf of Aqaba, which is the southeast boundary of Sinai. SES is located in the southern part of Sinai. The highest altitude in Sinai exists in the southern part and amounts to about 2500 m above the mean sea level. The altitude changes rapidly to about 1000 above the sea level in the middle of Sinai where the gradient changes slowly towards the Mediterranean Sea on the northern boundary.

In the southern part of Sinai, the altitude changes from the highest level in the middle to the sea level on the Gulf of Suez in the west and the Gulf of Aqaba in the east. The ground surface gradient towards the Gulf of Aqaba is steeper than that towards the Gulf of Suez as a result of that, the wadis in Sinai have three main groups according to their direction; i) some wadis run from the south of Sinai towards the north such as Wadi El Arish, ii) other group of wadis extends to the east south flows in the Gulf of Aqaba as Wadi Water, iii) Another group of wadis runs to the west south to flow in the Gulf of Suez as Wadi Leheta.

4.3 SOILS

In the part of Sinai where the SES Airport site exists, the basement complex is exposed as a triangle which covers an area about 7500 m2. It seems to be a part of the Arab-Nubian shield raised between the two grabens, which are now Suez, and Aqaba. The rock of this block is mostly granites.

Where the Airport site is situated, exposed pre-cambrian igneous and metamorphic rock form the Arabo-Nubian shield exists. Field and petrographic evidence indicate that the shield consists of a series of island arcs which were carbonized during the Syrian Arc structures and attain a more northerly trend, aligning themselves with the sinistral Dead Sea faulty system and the pelusium line, the east and the northeast of Sinai in these regions, the folds appear to be reminiscent of fault plane drag.

4.4 HYDROLOGY

Sharm El-Sheikh generally can be characterized as an arid area with a maximum daily average rainfall recorded is to be 20.4 mm. The area where the airport was constructed is surrounded by various Wadis (valleys), which are considered as a potential for floods. However, the location of the airport was carefully selected so it lies in a plane area, which minimizes the threat of flood initiation. Flash floods hazard study was prepared by Kamal Hefny (1991). The nearest main Wadis surrounding the airport are considered in this study as follows:

- Wadi El Seegha, which is located at the north side of the airport. Wadi Umm Merikha (El Kersh bay), which is located south west of the airport.
- Also, Wadi El Aaat (El Sharki), is considered one of the located further south of the airport
- A hydrological analysis was carried out on both Wadi El Seegha and Wadi Umm Merikha as they are considered the closest to the airport.
- Surface runoff in the study area results from the intense rainfall. The two wadis in the study area are usually flooded in fall and spring. Many factors affect the nature of runoff of each basin such as, rainfall characteristics, catchment's characteristics, and storage characteristics.

4.5 HYDROGEOLOGY

The peak discharge of Wadi El Seegha is relatively small, and thence points to low risk conditions. However, the flood plain of Wadi El Seegha acts as a receiving body of the storm drainage system generated by the airport. Although floodplain areas have a substantial runoff storage capacity thus significantly attenuating the flows reaching the outlets of the two catchments, flood elevation will increase in the intersection area.

The main stream of Wadi Umm Merikha is currently intercepted by Al-Salam road which is about 2.0 meters above the Wadi ground level. The road in this area acts as a dyke, which can retain the flood of the Wadi. No drainage structure has been noticed during the field visit carried by the Consultants. Consequently, flood elevation will increase upstream the road. Thus, protections measures will be very useful in reducing the hazards of flood at the highway. Alternatives should be sought economically and technically.

4.6 ECOLOGY

The underwater biological resources represent a major concern to most of the tourists in South Sinai including the Sharm El-Shaikh area. Besides, migratory birds which migrate to/from this place also characterize the ecological system in South Sinai. There are two main seasons for migratory birds each year; the Go season (autumn): From August until November, and the Return season (spring): From March until May. There are four protected areas around the airport site:

- Ras Mohamed National Park: This is the first Egyptian National Park. The boundaries of the National Park extend from a point opposite the Qad el Hamden lighthouse on the Gulf of Suez to the southern boundary of the Nabq Protectorate on the Gulf of Aqaba. The area includes the islands of Tiran and Sanafer and all the shorelines of SES.

- Nabq Managed Resource Protected Area: This is located 35 Km north of SES, and was declared a Natural Protectorate in 1992.
- Abu Galum Managed Resource Protected Area: This is located north of Nabq, and declared a Natural Protectorate in 1992.
- Saint Catherine Protected Area: This was declared protected in 1987 and covers an area of about 9000 km^2 of the high South Sinai Mountains.

The Nature Protection Sector, Department of Protectorates of the Egyptian Environmental Affairs Agency, supported by the technical assistance of the European Union, administrates the protected areas. In addition, The Gulf of Aqaba Environmental Action Plan (GAEAP) was prepared in November 2000 with the assistance of the European Union and the World Bank. This action plan is expected to create equilibrium where the tourism and a fragile extraordinary environment can coexist.

4.7 AIR QUALITY AND NOISE

The parameters of Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Ozone (O_3), Carbon Monoxide (CO), Suspended Particulate Matter (PM10) and Non-Methane Volatile Organic Compounds (NMVOC) have been measured from the existing air quality monitoring station located at the airport area. Based on the results and the comparison between the measured and the allowable limits stated in Law no 4/1994 for the environment, all measurements are below the allowable limits which a clear indication of the good quality of the air at Sharm El sheikh city.

4.8 CULTURAL RESOURCES

The project site does not include cultural places. There are, however, several cultural resources in the Saint Catherine Protected Area. For example, Saint Catherine Monastery, built over 1500 years ago by the Roman Emperor Justinian in this area, is the oldest Christian Monastery in continuous existence and belongs to the Greek Orthodox Church. Then, Gabal Musa, which is an elongated granite mountain with numerous ravines in this area, has been honoured by Arabs with the name Moses, Gabal Musa. They are protected under the rules which protect the Saint Catherine Protected Area.

4.9 SOCIO-ECONOMIC CONTEXT

4.9.1 National and Regional Economic Context

Sharm El Sheikh is one of the biggest cities in South Sinai Governorate. It is one of the most famous diving centers and beach resorts in the world. The city is considered as the most famous tourism centre in South Sinai Governorate.

Tourism accounts for over 5% of Egypt's GDP; with total revenues of about USD 11.6 billion (in 2010). The industry employs about 12.6% of the labour force in Egypt. More importantly, the industry is the number one foreign currency earner for the Egyptian economy. Tourism is expected to remain one of the main drivers for the Egyptian economy in the decades to come. Within Egypt's tourism scene, Sharm El-Sheikh has a major role, where 35% of the country's tourists in 2010 arrived and stayed in this city.

4.9.2 Socio-Economic Characterisation of the Villages

The population in Sharm el Sheikh has increased rapidly with 16.9% annual increase from 1986 to 1996, mainly because of the fast growth of tourism sector. It is estimated around 40 thousand in 2003 and is forecasted to reach 122 thousand in 2017, according to South Sinai Environmental Action Plan 2004. Sharm el Sheikh is now the biggest city in South Sinai Governorate.

What is remarkable is that more than two thirds of inhabitants (15 years old and over) in South Sinai are male. This is because of low employment of women in tourism sector (hotels and restaurants). In fact, the proportion of female personnel in this sector is only 4.1% in 2006 according to CAPMAS data. The unemployment rate in South Sinai is 4.85% in 2006 according to 2006/07 Census. This is much smaller than the Egypt's (9.72% in 2006), thanks to the tourism sector development.

5. ALTERNATIVE SOLUTIONS

5.1 JUSTIFICATION OF THE CHOICE OF SITE

There is no foreseen alternative for the project. The new project is the best solution in order to enhance the infrastructure of the airport. Yet, the only alternative is to reorganize the current two TBs and runways and renovate them in order to save more money. This proposal is not viable since the renovation of the current TBs will not be able to have the same number of tourists 18 million. Moreover, the renovation will be for a limited space. That indicates the airport will not be useful for the promising tourism movement. As for the Airfield, the intensive use of two existing runways could lead to accidents; the consequences on the environment and the economy of the region are incalculable

In terms of site location, there were no alternatives as the airport has to be constructed adjacent to the existing facilities. The close proximity of the terminal buildings provides numerous economic advantages. Another advantage is facilitating the connections to the networks and utilities used by the existing terminal building and airfields including electricity, telephones, water and sewage. Construction and procurement of all such elements would be a lengthy and expensive stage of the project had it been a completely new airport.
From the viewpoint of the airport users and passengers, having the new terminal building adjacent to the existing one will greatly improve the flow of passengers and the efficiency of services provided since having to transfer passengers between airports would be avoided. As for the airfields, the construction of a new runway allows the simultaneous use for landings and takeoffs. This results in a greater capacity to process air flow under conditions of optimum safety. Several alternatives in the choice of location and orientation of the runway were studied. The solution retained allows i) the receipt of aircraft range wider and more imposing scale (type airbus 380), and ii) the optimization of pollution (mainly noise) for residents

5.2 'NO PROJECT' OPTION

If the project were not realised, the conservation of area would be guaranteed. The 'no project' option will still cancel out any potential risk to the natural resources of the site such as the risk of air pollution, the contamination of surface water and groundwater, and the contamination of the soil.

As for the inhabitants, the project does not cause displacement of people since the construction will take place on an area belonging to the airport

The conservation of the current situation without project will not deal with the additional demand of tourists for the next 15 years and will have a negative impact on employment and socio economic development of the region.

6. POTENTIAL IMPACTS AND MITIGATION MEASURES

6.1 Pollution and Soil Erosion

The soil can undergo a range of impacts due to construction activities (removal, modification, erosion, mixing, compaction, loss, or contamination). In most cases disturbance to the soil cannot be altogether avoided and therefore it is important to manage the impacts during construction.

6.2 Risks of Flooding

The airport area is surrounded by various Wadis (valleys), which are considered as a potential for floods. However, the location of the airport was carefully selected so it lies in a plane area, which minimizes the threat of flood initiation. One of the objective of the ESIA was to establish the areas of potential risk of inundation during flood events of 100-year probability of occurrence. It has been placed a requirement to provide airport authority with information about the extent of Wadi's floods, in order that airport activities be guided away from areas at risk of flooding.

6.3 Water Pollution

The run-off waters in the rainy season risk altering the quality of the surface water by the propagation of polluting substances. Chronic or accidental pollution may be generated during construction and operational work. The overall risk of contamination of the layers is considerable. However, this risk is attenuated after the construction and disaggregation works, which will compact the surface layer and reduce permeability. In the exploitation phase the zones where the risk of contamination is highest are the parking spaces, the oxidation pond, the fuel tank, the central utility complex and the runway. Since the replenishment of the superficial aquifers is made possible by the restitution of the airport drainage towards natural watercourses, the risk of pollution of the subsurface waters is present but remains nonetheless controllable.

The construction site is lacking any natural remaining water bodies. As a result of the arid environment, a deficit of natural permanent water bodies exists at the site of the proposed terminal building. The main source of surface water runoff is likely to come from the contractors dust suppression activities. In which case, runoff will be captured and directed into evaporation trenches and ponds where necessary. Any drainage channel or storage pond will be designed away from airport operations, so should a pond fail, airport operations will not be affected.

The project site is located at arid conditions and surface & ground water resources are actually limited. Therefore, no natural permanent surface water bodies will be affected by the operation of the new building and new runway. In addition the groundwater level is relatively deep; it is unlikely that the project will have an impact on groundwater, either during construction or as a result of development of the existing project and runway operations. Groundwater will not be abstracted for any form of use as part of this project. Therefore, due to the depth of the groundwater resources and limited natural surface water, groundwater recharge is an issue that needs to be addressed.

6.4 Impact of drainage

Sharm El-Sheikh Airport is located in an arid area with very low precipitation rate. The annually total rainfall is about 6.51 mm/year .(based on the last 20 years data collected from the Meteorological Authority for SES Weather Station). However, precipitation is occasionally

very heavy during short periods resulting in flash flooding. The most recent flood occurred in November 17, 1996 (48.3 mm/day). At that time, airport authorities indicated that the Airport was not affect by this heavy precipitation. The airport has smooth and well-drained areas with sufficient stability to allow the safe movement of aircrafts under all weather conditions. This has been accomplished through an efficient drainage system that collects and removes excess water and protects all slopes from erosion. The topography of SES Airport slopes towards the seaside (southeast). The soil characteristics consists of an upper layer of approximately 2-0 m of yellow graded sand, covering a layer of yellowish graded dense sand of average 5 m thick with a relatively high permeability value. The runoff from pavements of apron area, taxiways, and runways is collected using longitudinal and side slopes so surface drainage is directed towards the surrounding sandy soil. The topography of the soil facilities surface drainage both through existing culverts such that part of generated storm water will be directed to east side of the airport (Wadi El Segha flood plan) while the other part will be collected towards the west side of the airport into large plain area.

6.5 Impact on biodiversity

The ecological impact assessment has shown that the proposed development site lacks any significant biodiversity, and therefore impacts from site clearance and earthworks are likely to be minor. Natural landscape, surface features and habitats in this area have been displaced and lost as a result of the development of the existing airport facilities over the past few decades. No wild fauna appears to be specifically associated with this area although a number of common, commensally animal species probably occur within the area. The site and its immediate vicinity appear to be of a little ecological significance.

6.6 Energy consumption

A typical energy system at an Airport is mainly divided into: the energy supply, which includes the electrical systems and the fuel supply systems, and the energy demand, which includes the electrical energy demand and the fuel demand. In Sharm El-Sheikh Airport, the electrical energy supply system comprises of the Power plant, the substations for step-down and electricity distribution, and the emergency power supply system, i.e. Diesel generators. The airport is currently being supplied by electricity through two 22KV power transmission lines of 22 Km lengths each extended from the city power grid. There are two substations, which contain 4 power transformers, three of which are of 2 MW capacities and the fourth is of 0.8 MW. There are also other 6 power transformers of different capacities supplying power to other major energy consuming activities at the airport. The existing emergency power supply system consists of 6 diesel generators of the following capacities of 2X1000 KW, 2X275 KW, and 2X125 KW.

The fuel supply system consists of the aviation fuel supply system including, mode of transport, aviation fuel storage facilities, distribution systems, and the vehicles fuel supply system. The Misr Petroleum Company is providing the aviation fuel supply services at the airport. Aviation fuel is supplied to the Airport by means of trucks from two oil refineries located in Suez and Alexandria. There are three existing aviation fuel tanks of 1.250 million liter capacity each. Thus the present storage capacity in SES Airport is equal to 3.75 million liters. In order to meet the growing demand on aviation fuel as a result of the increased of the number of flights, there are some expansion plans to increase this storage capacity at the airport by about 60 % to reach 6.25 million liters. Currently, trucks are fuelling the Airplanes; however, construction is underway to build 20 concrete hydrants pits for aviation fuel supply. On the other hand, there are no plans to further expand the aviation fuel supply system for the new extension project.

Currently, there is one fuel service station within the Airport boundaries, the station is operated by Egypt air and it serves the Airport fleet of vehicles. The underground storage capacity of this fuel station is 22000 liters of gasoline. To meet the expected growing demand on vehicle fuels, this storage capacity will be doubled. The average monthly aviation fuel consumption at SES Airport was found to be equal to 12 million liters. This consumption is expected to sharply increase as a result of the airport expansion and the growing number of flights.

6.7 Solid waste

During the construction phase, It can be expected that there will be some waste oil produced from vehicles and machines during the construction phase. The type and quantities of solid and hazardous waste, which could affect environment, were identified. Construction activities will result in the generation of a variety of wastes that can be divided into distinct categories:

- Excess Excavated Material. Defined as inert material removed from the ground and sub-surface that will not be reused on site. The volume to be generated is unknown at this stage. However the estimated volume of the generated waste is 6,000 tons.
- General Construction Waste. Comprises unwanted materials generated during construction, including rejected structures and materials, materials which have been over ordered or are surplus to requirements, and materials, which have been used and discarded.

The amount of waste resulting from the movement of aircraft over in 2008 has reached about 5000 tons on average, through the operation of two building passenger with an account in the amount of waste when the third building to work in parallel, and receives a greater number of aircraft and the latest levels, and larger models that work in the world, assuming the worse case senior the amount of waste in this case will increase up to 10,000 tons Taking into account the airbus A380 and jumbo jet (747) the amount of hazardous waste expected from aircraft per flight, is estimated, on average, 70 kg

6.8 Wastewater

The wastewater currently produced from airport is treated and used for irrigation, analysis in underway for the quality of this water.

The new building wastewater and sewage system will be connected to the existing airport sewer system for processing for irrigation. The water quality should comply with the environmental Law 93/62 for Wastewater Discharge to Sewer System (as modified by Decree 44/2000).

6.9 Air Quality

During construction: Potential impacts during the construction phase of the project will arise mainly from the powered mechanical equipment to be operated at the construction worksite. Dust generation may affect residential areas. The current terminal buildings passengers, visitors and employees may experience nuisance from dust. Earthworks operations will need to be carefully managed to ensure airport operations are not adversely affected, especially given the close proximity of the works to the main runway and may mean suspending works in unfavorable wind conditions if dust cannot be managed at acceptable limits.

During operation the most critical concentrations compared to national and international standards and limit values are the short-term (1-hour average maximum) concentrations of Sulfur Dioxide that may occur along the road leading to the airport and around and close to the terminal buildings. Other than that, all the concentrations for the other parameters will be much less than the allowable limits stated in law 4/1994.

6.10 Noise pollution

Three categories of construction noise sources have been defined based on the combination of the following activities: i) Demolition and Site Clearance, ii) Construction - Individual pieces of construction equipment produce relatively high outdoor noise levels, and iii) Construction Yards - It is unknown at this stage where construction yards (if any) will be located. This will need to be confirmed by the contractor and included in the Contractors Environmental Management Plan, should off site construction yard(s) be required.

Detailed Noise Impact Assessment was carried out with the main aim of assessing what effect new development will have on noise levels generated from Sharm international airport. It is considered unlikely that new developmentitself will contribute significantly to noise effects on the surrounding areas, while the increase of air traffic will potentially have a significant impact on the current noise levels generated from the airport.The new runway will have a positive impact on noise out from airport as now the surrounding area is nearly empty. As for Noise Prediction Modeling Results, Certain locations were selected to satisfy all common rules and regulations for the Sharm airport and all of this is fully working now at all conditions and give a full database of results for noise around areas and the airport itself. This monitoring station performed its intended target. There is no need for any new measurements now as all measurements recorded instantaneously with the current system and are stored for future analysis and manipulation.

6.11 Land acquisition and resettlement

A land Acquisition Assessment was conducted on the airport sites. In Sharm El-Sheikh Airport, the land is state property legally transferred to the Egyptian Airports Company. The land is fenced and is adjacent to the existing terminal and is surrounding by more land belonging to the Egyptian Airports Company. Presently the land is not used for any economic activity and there are no claims on it whatsoever. Based on this, the operational policy on involuntary resettlement is not triggered.

6.12 Employment creation

The project has the potential to attract an influx of sizeable populations towards the sub-region, be it of a temporary (construction phase) or permanent (operational phase) nature. This wil have a major positive impact in terms of job creation. Persons employed during construction will vary between 1000-2500, most of whom will be Egyptians.

There will also be over 500 staff will operate the airport once completed. The most significant impact, however, is the indirect jobs to be created, which are estimated at around 240,000 jobs, covering areas as far as Cairo, Luxor and Aswan; destinations that will be visited by the Sharm El-Sheikh tourists. The positive impact of the project on Sharm El-Sheikh will be the largest, as most of the city's population is employed in the tourism sector. This includes women who engage in crafts making and tourism souvenirs. On the national level, the ratio of women employment in the tourism industry is high

compared to other industries, with an average of 60% of the country's women employment being in the general services and assistant jobs, a sizable share of which is in the tourism industry.

6.13 Impacts on the economic activities

Sharm El-Sheikh is predominantly a tourism city, made up of mainly tourist resorts. The project will have a major positive impact on economic activities in the city and on development of private sector activities, ranging from the small to the large scale businesses. As tourism industry flourishes in the region, all the associated economic activities will witness major growth, both in quality and quantity.

6.14 Traffic and Access Road Construction Impact

During construction: Because the traffic generated by the construction phase will use the ring road, and where the traffic light at the moment on this road, so there is no potential impact in view of the congestion or the follow of movement, but that poor visibility and traffic-safety and quality of traffic organization may be the reason for the many accidents during the construction phase, special, and that the ring road is still under construction and not yet completed the full geometric elements especially the U-Turn. The view of the relationship between volume and capacity on the ring road, the level of service is level "A" during the construction phase.

6.15 Cumulative impact

No fundamental or negative change to the economic and social systems of the region's communities is perceived as inevitable. In effect, in certain cases it is possible to envisage economically stronger communities making use of increased tourism traffic and movements.

7. ENVIRONMENTAL RISK MANAGEMENT

The environmental risks resulting from the execution of the project are considered typical construction related impacts consisting of noise, dust and construction related traffic. These include (i) Safety risk to the public at or near construction sites (ii) Noise and emissions ; (iii) Soil removal, modification, mixing, compaction, loss, or contamination due to construction activities and (iv) Generation of dust and emissions due to construction activities-_These impacts will be short term, and will be managed by the contractor as per the mitigation measures contained within the construction environmental management plan to ensure the activities meet the legal requirements of the Bank and the Government as well as the best practical measures.

Safety risk - There is a risk of injury to the population living or working near the project site at the time of construction. This risk is lowered by the fact that the construction area is already a fenced area with controlled access and further risk can be mitigated by closing construction area.

Noise and emissions- could pose health hazards to the public and workers in the project- Noise form and emissions from construction Vehicle/equipment exhausts can be reduced through the utilization of hearing protection for workers exposed to the loud noise. The site layout of the airport is also designed INS such as to avoid noise impacts on residential areas.

Soil Disturbance - Construction activities will result in soil, modification, mixing, compaction, loss, or contamination that can a range of impacts due to construction activities (removal, modification, erosion, mixing, compaction, loss, or contamination). In most cases disturbance to the soil cannot be altogether avoided and therefore it is important to manage the impacts during construction. The mitigation measures to reduce this risk will include the restriction of vehicle movements to construction areas and roads; topsoil and excess soil clearance from the construction activities and storage in an area protected from wind and regularly sprinkled with water until reused , re- fill or disposed outside the site.

Generation of dust and emissions due to construction activities- It is expected that the air quality pollution level, especially dust and suspended particulates, will significantly increase in adverse environmental impacts. This risk will be mitigated by putting all material resulting from excavation in a location protected from wind and regularly sprinkling them with water until reused for fill or disposed outside the site (ii) the backfilling of all excavations and their reinstatement to a similar condition as existed before the excavation started; (iii) the watering of temporary haul roads whilst in use to reduce dust production during construction; (iv) squarely covering all hauling to eliminate dust that could scatter while moving in and out of the site;(v) the covering of all delivery vehicles delivering material to the site to avoid material spillage. (vi) regular watering of the construction sites to minimize fugitive dust generation and (vii) limiting vehicles and equipment speed inside the construction site and unpaved roads by introducing speed limits and the restriction of off road driving.

There are other potential risks associated with the project during operation. as follows:

Noise- The increase of air traffic will potentially result in a significant increase in noise levels generated from the airport. There is little possibility that the new terminal and runway will generate noise to adversely affect the surrounding areas. However, airport employees working on the aircraft apron, and those who are servicing the aircraft between arrival and departure, will be exposed to elevated levels of noise. This risk can be mitigated against by adopting and applying the ICAO standards for landing and takeoff procedures, proper management of landing and takeoff at off-peak hours (11 pm to 6 am) to minimize noise; installation of new permanent automatic noise monitoring system with the latest software to correlate radar Information to noise level; regular maintenance of service vehicles, provision of safety tips, supplying staff with appropriate hearing protection devices to reduce any potential harmful effects that may result from exposure to these activities and; applying the health and safety roles will minimize the noise affect on those groups. The new terminal building and new runway complex are designed and will be constructed using materials that will limit external noise being received inside the terminal building. The provision and use of air-conditioning will reduce the level of noise exposure to the staff by providing an enclosed good working environment. The noise monitoring terminals at new locations will accurately monitor noise level around the airport area that can be used for noise management and synchronize the new runway with the old one to minimize noise level around the airport area

Air Quality – The air quality meets the quality limit values as provided in Egyptian legislation. However, there are risks of accumulation of higher level of So2 associated with the impact from the road traffic bringing passengers to and from the Airport. The SO2 exposure predicted at the Terminal area will be reduced by improving the quality of cars entering the airport. Further, the change from using diesel to CNG in all mini buses and buses will also reduce some of the impact. In addition, proper road and traffic flow design around the airport will militate against the deterioration of the air quality in the town.

Waste disposal- Large amounts of solid waste will be generated from the incoming flights and the runway. The day-to-day operation of new building and new runway also has the potential to generate large amounts of waste from offices, shops, cafes and restaurants, and from passengers and airport visitors. Any temporary storage of waste on site should be in bins that are fitted with lids to ensure no rainwater can enter, that no waste material will be blown away by wind, and also so no vermin can access the waste. Waste receptacles should be made secure to stop any opportunists from gaining access to the refuse.

7.1 Bird strike

Birds present an important item to avoid incidents of collision between aircraft and Birds. The airport will adopt all measures and all equipment of avoid bird collision including : requiring planes to fly at appropriate, altitude and speed for landing and taking off, installation of proper equipment at the airport for bird detection, optical scan of the runways before taking off and landing, monitoring bird numbers and movements, and installation of air guns

8. MONITORING PROGRAMME

The Executing Agency will assume overall responsibility:

a) For ensuring the design and assessment of the physical work options is in accordance with national environmental norms, regulations and requirements.
b) For project implementation of the activities detailed under the project EMP. Consulting design engineers will assist the executing agency by providing designs, with the preparation of the bidding documents with specifications taking into account the appropriate environmental protection requirements.

Contractors will be responsible for the implementation of the works in accordance with the environmental requirements specified in the bidding documents. EAC will monitor project performance.

The Monitoring Plan of the Environmental and Social Management Plan is being prepared and will include three internal elements:

- ✓ **Monitoring of the Site Environmental and Social Management Plan (SESMP):** Monitoring will be carried out in order to verify and document that the building and tender activities associated with the construction of the airport and corresponding facilities (temporary or permanent) are carried out in compliance with the requirements of the SESMP. It will also ensure that the feedback required to update and revise the SESMP is available.
- ✓ **Monitoring of impacts during the operation phase (EMS):** The EMS will be subject to continuous monitoring in accordance with a specific calendar. The revision process and establishment of ESMP reports will be done using inspection reports carried out monthly (internal inspection programme, environmental performance as well as zones and degrees of non-compliance); quarterly (source of primary information concerning the project activities as well as environmental compliance) and yearly (revision of environmental policy, revision of environmental indicators, summary of environmental monitoring programmes, discussion of any major environmental incidents and future changes to national environmental legislation and/or regulation).

The SESMP will be prepared using EAC's budget. No specific estimation was made as to the cost of the Plan, as this will largely follow existing arrangements used to prepare monitoring plans for the Hurghada airport extension project currently under implementation.

9. PUBLIC CONSUTLATION AND THE PUBLICATION OF INFORMATION

Public consultation is an integral part of the entire impact study process. Consultants consulted with the different groups affected by the project and took their point of view into consideration. These groups were met with several times:

- The first public consultation meeting for the project was held on November 5, 2009 at Lagona vista resort after wide publicity in the local news papers.

- The second public consultation meeting for project was held on January 31, 2010 at Hotel of Sharm El Sheikh Sports Club.

- The third public consultation meeting for project was held on April 23, 2014 Jolie Ville Hotel in Sharm El Sheikh

It was concluded in these consultations that the project will result in a number of positive impacts on the natural and socio-economic setting of the area. It was established in these consultations that most of the components of the project would pose no, or only insignificant, environmental risk, with the implementation of certain steps to improve the construction and operation phases. The final ESIA conclusion indicated that the project, if implemented with the suggested mitigation measures, will result in some unavoidable, but minimal environmental risks. This is considered to be within environmentally acceptable limits as set by the Egyptian laws and regulations.

10. FURTHER INITIATIVES

Further initiatives aimed at the economic and socio-cultural development of the affected communities exist for the region. These initiatives generally target the development of Sinai's population, with various donors having participated in the past, and anticipated to continue in the future.

11. CONCLUSIONS

An Environmental and Social Impact Assessment has been carried out for the project in 2010 (final version edited in February 2011 and revised in 2014). This study analysed the problems associated with the airport's construction and operation phases: air emissions and noise pollution, waste management, erosion and flood risk, resettlement of populations, socio-economic impacts, safety of communities and workers, etc...

The Site Environmental Management and Monitoring Plan will constitute the framework for the planning and execution of activities during its construction and operation phases. It will be compliant with Egypt's legal and regulatory requirements, and those of AfDB, as well as the international civil aviation standards.

This plan will constitutes a method of ensuring monitoring and defines the roles and responsibilities of the different stakeholders in the design and execution of the project.

12. REFERENCES AND CONTACTS

The documents reviewed by the African Development Bank include the environmental and social impact assessment for the Sharm El-Sheikh New Airpot and its annexes, prepared by CONSULTANT OFFICE in 2010 and an updated version in 2014. Other documents reviewed by the Bank also included "Fixed Manual Temporary noise measurements for TB3 and SSH" prepared by Mansour El-Bardisi Consultants.

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