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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 reviewed according to the policies and procedures of the African Development Bank and the operational policies of the World Bank.

2. PROJECT DESCRIPTION AND JUSTIFICATION

2.1. PROJECT DESCRIPTION

The airport is located about 575 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, plus contact stands shall occupy an area (land area) of about 183,000 m^2.

The terminal building is designed to contain the following:

- Departure Hall consisting of:
  - Lower floor for international and domestic departure halls, shops, duty free area, baggage handling facilities and some other support services;
  - Lower floor (central area) for central service offices, mechanical area, café, corridors… etc.;
  - Ground floor for passport checks area; check in hall, and public departure hall, offices etc.;
  - Ground floor (central area) for immigration hall, food outlet area offices, toilets…etc. (gross floor area).
- Arrival Hall consisting of:
  - Lower floor for international and domestic arrival halls, baggage make-up, and some other support services;
  - Ground floor for public arrival hall, visa processing, international and domestic baggage claim, custom area, offices… etc.;
  - First floor (central area) for restaurant area, kitchen area, corridors… etc.;
  - Second floor (central area) for cafeteria, VIP lounge, corridors …etc.;
  - External Works, consisting of electrical/mechanical plant, sheds for security services and mosque;

- Car Parking Area, consisting of car parking area.

The associated airfield works are designed to contain the following:

- Third runway of length 3,600 m
- Taxiways and aprons

The new terminal building will 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: Recent satellite image for Sharm El-Sheikh Airport site location and the position of new building and new runway that is expected to start peroration from 2015

The project's terminal building will be constructed on the estimated area of 100,000 square meters. It is expected that the new building 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 2025 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.
- The Airport authority is currently using a company to clean, collect and dispose the solid waste generated from all activities at the airport. The solid waste management system is operating as far as collection, hauling and final dumping at dumping site located at 17 km away from the Airport. For the new terminal, the Solid Waste Management Plan is based on the following actions:
    - cabin waste separated and transported for offsite disposal and recycling
    - Food waste disposed of to landfall as soon as possible, with any storage time at the airport minimized.
    - Any existing compaction facility at the airport will be utilized to reduce the amount of waste and the number of trips needed to take the waste to the disposal site.
    - General refuse bins will be provided inside and outside the terminal building in sufficient number and size. Bins must be covered to prevent wind collecting litter.
    - A new transfer station will be erected for waste at the new building.
    - The solid wastes will be transferred to the new landfill of Sharm El Sheikh.

Forty two (42) months period was provided for the completion of the airport construction works. The construction phase must be completed in September 2015 and the exploitation of the airport is planned for 2016.

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 an disputes.

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 expected benefits of the project are following;

- Reduction of congestion, particularly during high season
- 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 in airport procedures and associated 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

Egyptian 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.

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. These noise regulations are under revision by EEAA currently.
Air Quality	Article 40 of Law 4 (articles 42 and 36) of its executive regulations maximum allowable limits for the concentration of pollutants. These regulations are also under revision by EEAA.
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.

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 POLICIES AND PROCEDURES OF THE DONORS

The ESIA was carried out and reviewed according to the national requirements and the policies and procedures of the African Development Bank and the World Bank.

The AfDB' policies applied for this project are:

- Environment policy
- Environmental and Social Assessment Procedures for public sector
- Gender Policy
- Cooperation with civil Society Organisations policy

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.

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.

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

Sharm El-Sheikh, as a growing city with all its assets, attracted new labors from all over Egypt as well as from the European cities. Most of the population is working in the tourism, construction, health and education sectors. The total inhabitants of Sharm El Sheikh hit some 35000. Those are accommodated in 9700 housing units, 3% of which are owned by the indigenous residents (Bedouins), 11% provided through government housing program, and 86% is mainly tourist lodges.

Bedouins as the native population of the desert retain their traditional rights and continue to occupy their settlements. Many Bedouins were employed in several tourist projects as guides to the desert, as rangers for the National Parks of Nabq and Ras Mohamed. They also provide services to the protectorates.

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 new terminal building 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 objectives of the ESIA was to establish the areas of

potential risk of inundation during flood events of 100-year probability of occurrence 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 new terminal building 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 on biodiversity

The ecological impact assessment has shown that the new terminal 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.
However, the increase of touristic activities increases pressure on the marine areas (mainly diving activities). A monitoring program and an Action plan is actually in place now by the national authorities to monitor and control this impact.

6.5 Energy consumption

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.

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. 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.

6.6 Solid wastes

Airports generate different types of solid wastes and are usually characterized by the presence of wide variety of hazardous wastes. The major activities which is generating wastes (solid – hazard) in Sharm El-sheikh International airport is the Cleaning, Catering, Trade, Ground Aviation Services, Maintenance, Waste Water Treatment, Medical and Administrative Activities. Plastics and papers is the main constituent for the waste in most of the airport activities (cleaning and administrative activities). In addition, it was found that 100% of the wastes composition coming from Retail Shops (Duty free shops, Bazaars, etc…) and trade activities is the packing papers. The only exception of this composition rule is the kitchens and restaurants wastes (catering activity) in which the organic waste is approximately equal to the ratio of all other waste constituent. Currently, a contractor is in charge of the collect and the transportation of solid wastes to the municipal dumping of Sharm, 17 km away from the airport. During operation, a certified contractor will handle and transport the wastes to the future landfill of Sharm.

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).

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 Solid Wastes Management Plan has to be detailed and agreed with national authorities and will be incorporated in the ESMP construction (Contractor) and operation phase (EAC).

6.7 Wastewater

The wastewater currently produced from airport is treated and used for irrigation. The new building wastewater and sewage system will be connected to the existing airport sewer system for processing for irrigation.

6.8 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, given the close proximity of new building to the works. 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 important air pollutants originating from the airport activities are nitrogen oxides, hydrocarbons and carbon monoxide. Particles may also be emitted from the airport activities. However, the contribution of e.g. PM10 from airport activities compared to the "natural" background concentration in the area is completely insignificant. The same applies for SO2 emissions as the only source of SO2 in the study area will be the emissions from ground traffic to/from the airport where most of the mode of transport is the diesel buses which emit SO2 and Particulates.
An air modeling using The short-term industrial source complex model (ISC3ST-Prime) has been used in this study. 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.

6.9 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.

Prediction of the noise level around the airport was assessed on Integrated Noise Model; INM 6.0c. The construction of new runway will vastly reduce the negative impact of noise on the local population of Sharm city, eluviations of noise is attributable to two key factors: expected technological advancements in jet engine manufacturing, and a lower population in the area impacted by flights on the new runway.
If trends of advanced technology continue on the same path as they have for the last fifty years, noise produced by jet engines will be significantly reduced. Manufacturers, like

Boeing and Airbus, are expected to make dramatic changes to engine design within the next ten years.
These projected industrial enhancements, along with airport regulations on nearby construction, will guarantee a reduction in noise level on the surrounding of Sharm International Airport.
It is considered unlikely that new building itself 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 assessment of the likely impact of the new terminal building will have on the local noise levels concluded that new terminal building will reduce noise levels inside the departure and arrival hall due to Construction the terminal building. Inside the new terminal building, the use of proper construction material limits potential noise problems inside the building. The new runway will have a positive impact on noise out from airport as now the surrounding area is nearly empty.
During the consultation with the regional authorities, it was confirmed that Sharm El Sheikh's Master Plan considered the extension of the airport.

6.10 Employment creation

It is estimated that around 2,500 employees (management, staff, and daily paid workers) will be involved in the construction of new building.

There will also be over 500 staff that 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.

6.11 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.

6.12 Traffic and Access Road

Because the traffic generated by the construction phase will use the ring road, and where the traffic light at the moment on this road, 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.

The negative impact during the operational phase is due to the low level of service for each of the Dahab U-turn and Nabq Intersection, the delays at each of the Dahab U-turn and Nabq

Intersection and the probability of accidents at each of the Zayed road, Ring road, Dahab road, Dahab U-turn and Nabq Intersection.

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. There is also a risk of injury to the population living or working near the project site at the time of construction. This risk can be mitigated by closing construction sites closed to the public during the execution of the project.

Noise and emissions could pose serious 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.

The potential risks associated with the project during operation are:

- 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.

- 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

EAC will assume overall responsibility:

- For ensuring the design and assessment of the physical work options is in accordance with national environmental norms, regulations and requirements.
- 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 (ESMP Construction phase): 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 ESMP. It will also ensure that the feedback required to update and revise the ESMP is available.
- Monitoring of impacts during the operation phase (EMSP operation phase): The ESMP 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 detailed ESMP for both construction and operational phase will be prepared by AEC.

9. PUBLIC CONSUTLATION AND THE PUBLICATION OF INFORMATION

Public consultation is an integral part of the entire impact study process. The different groups affected by the project were consulted as follows:

- The first public consultation meeting for the project was held on November 5, 2009 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.

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. COMPLEMENTARY INITIATIVES

Further initiatives aimed to the economic and socio-cultural development of the affected communities exist already 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:

- Regional development programme (SSRDP): is an integrated regional development programme in the Governorate of South Sinai and is funded by the European Union for the protection of cultural and natural resources, and enhancing the living conditions of local communities, particularly Bedouins,
- Assessment of the Nutritional Status of Bedouins in Non-Urban Areas in Sinai South sinai, etc.

The Bank is studying the opportunity to propose some social initiatives (training on tourism for local people, women artisanal know-how's promotion, technical assistance to EAC in Environmental and Social Management, etc.).

11. CONCLUSIONS

An Environmental and Social Impact Assessment has been carried out for the project in February 2011.

An Environmental and Social 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 constitute 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 2011.

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