NOISE MAPPING, ANALYSIS AND MITIGATION

OF HURGHADA AIRPORT

BY

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B.SC. science (Biochemistry), Ain Shams University1992

A Thesis Submitted in Partial Fulfillment

of

The Requirement for the master Degree in

Environmental Science

Department of Environmental Basic Science

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Approval sheet

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ABSTRACT

During the course of 20th century, air-transport has become one of the world's most influential industries. Aviation facilities the expansion of world trade and provides opportunities for travel and tourism.

Aviation is one of the worldwide environmental problems. Airports face several environmental constraints including noise. Aircraft noise is the most significant environmental problem arising from arriving and departing of aircrafts. Therefore, airport related noise is an important issue that affect the passengers, the surrounding communities and nearby residential areas.

Hurghada airport is one of the key drivers of the economic growth of Egyptian airports. Over seven million passengers travelled through Hurghada airport every year. The expected increase in 2030 is twelve million. It is generally accepted that significant improvements to the environmental impacts of aircraft noise will be needed if the long-term growth of air transport is to be sustained.

The main goal of the study is the reduction of noise levels and its mitigations at Hurghada airport and surroundings area; to manage negative impacts of noise to make the right balance with positive economic and social benefits of the airports.

Reduction of noise levels around airports and nearby communities can be achieved through; Implementation of noise mitigation schemes, engaging communities to understand their concerns and Land-use planning and management to reduce the noise sensitive areas or to change activities to be compatible with airport. On the other hand, to preserve the quietest areas towards sustainable development.

Symbol	Definition
A-weighted	A standard and frequency weighting or filter used to reflect the frequency response of the average human ear
Contour	A line of constant value of an aircraft noise index around an airport
dB	Unit of level- measurement on a logarithmic scale of ratio
Event	A discrete noise occurrence caused by the passage of an airplane
Exposure level	Exposure measured on a decibel scale
Flight path	The trajectory of an aircraft in flight in 3-dimensional space
Footprint	Contour of constant event level for one approach and/or departure operation of a single aircraft
Hz	Hertz, a standard measure of frequency , cycles per second
ICAO	International civil aviation organization
ISO	International organization of standardization
LAF $_{max}$	the highest level of environmental noise occurring during the measurement time
LAF $_{min}$	Lowest level of environmental noise occurring during the measurement time
L day	Average sound pressure level over 1 night. this night can be chosen so that it is representative of longer period 12-16 hours

Symbol	Definition
L night	Average sound pressure level over 1 night. this night can be chosen so that it is representative of longer period 8 hours
DNL	Composed of the long-term A-weighted average sound level for day/evening/night respectively plus 0/5/10 dB
L den	Average sound pressure level over all days, evening and nights in a year. In the evening value gets a penalty of dB and the night value of 10dB
L A eq, T	A-weighted-equivalent continuous noise level Calculates a constant level of noise with the same energy content as the varying acoustic noise signal being measured during time T
SEL	Sound exposure level contains the same amount of acoustic energy over a normalized one second as the actual noise event under consideration
WHO	World health organization
ATC	Aircraft traffic control
FAA	Federal Aviation Administration
ACI	Airports council International
CDA	Continuous descent approach
NADP	Noise abatement departure procedure
CAEP	Committee on aviation environmental protection

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