

Chapter 10

A Proposed Framework for Environmental Risk Assessment (ERA) in Airports

Elen Paraskevi Paraschi

 <https://orcid.org/0000-0002-7226-8239>

University of Patras, Greece

EXECUTIVE SUMMARY

As environmental pressures increase globally, the need arises to understand and manage present and emerging environmental risks. The purpose of this chapter is to introduce a new Environmental Risk Assessment (ERA) approach to identify, assess, and report the level of environmental risks that can lead to significant interruptions, infrastructure damages, safety threats, and long-term effects on airport operations. ERA evaluates the quantitative and qualitative characteristics of environmental hazards, which involve physical, chemical, and biological factors that can imperil humans and infrastructure. The presented ERA framework is deployed in six phases, namely airport preparation, definition of the assessment scope and parameters, data collection and development of projection scenarios, risk assessment, mitigation and adaptation strategies, report, monitor, and review. In essence, the outlined ERA approach serves as a managerial tool to facilitate policy assessment and sustainable decision-making.

DOI: 10.4018/979-8-3693-2675-6.ch010

Copyright © 2025, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

INTRODUCTION

Airports play a crucial role in air transport pipelines, facilitating global linkages and promoting economic growth. However, airport operations can result in significant burden on environment, including air and noise pollution, habitat deterioration, and the release of greenhouse gases (Paraschi & Poulaki, 2021). Conversely, natural elements such as intense rainfall, crosswinds, bird collisions, and volcano eruptions can lead to significant disturbances in airport activities (Distefano & Leonardi, 2014). The difficulties of environmental issues are often complex and wide-ranging: involving a variety of factors, affecting many ecological domains. The person who undertaking work in airport that bear loss of life and property as the result, public scrutiny, legal responsibilities or any other intricate functions performed in an airport must need to perform risk managements. An adaptive decision-making process must encompass these inter diferentes, and can you consider the uncertainty that goes with strategies within. Environmental Risk Assessment (ERA) is a key tool for the identification and consideration of environmental risks in the processes behind airport development, compliance with sustainability standards and protection of biodiversity.

Environmental hazards are defined as those factors that can threaten the natural balance and functioning of environmental systems and risks to human health and well-being resulting from alteration or degradation in environmental systems. Environmental dangers may be inimical to airport operations in that they may pose enormous threats to people as well as facilities. First, they are health threats because they can add up to pollutants, diseases, and epidemics. The covid-19 outbreak recently destroyed the air transport system all around the world (Rume & Islam, 2020). There are also some prominent economic consequences of environmental risk events that can damage the infrastructure, hinder trade and tourism, and result in rising poverty, inequality, and health expenditure (Chen et al. 2011; EUROCONTROL, 2018). Other factors that could impact air transportation operations from this perspective are environmental impacts such as reduced biodiversity, soil erosion, and changes in weather patterns (Paraschi, 2023).

Risk, in this context, pertains to the possibility of an adverse effect, either directly or indirectly, on the environment or human well-being. The concept encompasses both the probability of an event occurring and the possible severity of its negative consequences, particularly in relation to the ecosystem and human well-being (Bernard et al. 2000). A systematic approach should be employed to conduct an environmental risk assessment whenever a management action is found to have the potential to affect the state of the environment or the health and well-being of humans. Lopez (2016) defines risk assessment as a methodical procedure for delineating and measuring the risks linked to perilous substances, procedures, activities, or occurrences.

22 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/a-proposed-framework-for-environmental-risk-assessment-era-in-airports/358739

Related Content

Guided Sequence Alignment

Abdullah N. Arslan (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 964-969).

www.irma-international.org/chapter/guided-sequence-alignment/10937

Bitmap Join Indexes vs. Data Partitioning

Ladjel Bellatreche (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 171-177).

www.irma-international.org/chapter/bitmap-join-indexes-data-partitioning/10816

A General Model for Data Warehouses

Michel Schneider (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 913-919).

www.irma-international.org/chapter/general-model-data-warehouses/10929

Information Veins and Resampling with Rough Set Theory

Benjamin Griffiths (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 1034-1040).

www.irma-international.org/chapter/information-veins-resampling-rough-set/10948

Association Bundle Identification

Wenxue Huang, Milorad Krneta, Limin Linand Jianhong Wu (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 66-70).

www.irma-international.org/chapter/association-bundle-identification/10799