

Noise Investigation Around Bandaranaike International Airport

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Abstract

Katunayake Bandaranaike International Airport is a crucial transportation hub in Sri Lanka, facilitating both passenger travel and cargo movement. However, the rapid growth of air traffic and urbanization around the airport has led to increasing concerns over noise pollution, which poses significant environmental and public health challenges. While road and railway noise are continuous and often predictable, airport noise is intermittent yet more intense, especially during take-off and landing. Although airport noise affects fewer people compared to road and railway noise, it has a more intense impact due to the high decibel levels. This persistent exposure can disrupt daily life, leading to sleep disturbances, stress, and long-term health problems such as cardiovascular disease and cognitive impairment. This study explores the extent and impact of noise pollution in areas surrounding the airport, aiming to measure noise levels, identify the primary sources, and evaluate the socio-environmental consequences for local communities. Noise levels were measured using sound level meters at 62 strategically selected locations, encompassing residential, commercial, and industrial zones within a three-kilometre radius of the runway and outside the airport boundary. Over the four days of data collection, a total of 161 readings were taken. The measurements were conducted during flight operations and compared with permissible noise thresholds defined by local and international standards. The data were analysed using ArcGIS to produce noise contour maps, enabling the identification of high-impact zones and patterns of noise exposure. Results indicate that noise levels in many residential areas and commercial zones exceed both local regulatory limits of 70 dB and international thresholds of 65 dB for residential areas. Aircraft operations, particularly during take-off and landing, were found to be the most significant contributors to elevated noise levels. Higher noise level zones were observed on both sides of the runway compared to other areas. When comparing noise levels between large and medium aircraft, the difference in values was minimal and not prominently distinguishable in graphical representations. Predictive modelling of future noise levels suggested that potential airport expansions, including the addition of runways, would exacerbate noise pollution, increasing the burden on surrounding communities. The study also highlights the impact on sensitive infrastructure such as schools and hospitals, further emphasizing the urgent need for mitigation measures. Proposed solutions include constructing noise barriers around the airport and between residential areas and the runway, promoting the use of quieter aircraft models, and implementing stricter noise abatement procedures. In addition, proper land-use planning to minimize the impact of noise on residential and sensitive areas is essential. Collaborative efforts among airport authorities, policymakers, and local stakeholders are critical to developing sustainable noise management strategies. Public awareness programs focusing on the health implications of airport noise and community engagement in mitigation efforts can foster a collective approach to addressing this issue. This research underscores the importance of balancing the growth of aviation infrastructure with environmental sustainability and public health. The findings provide valuable insights for policymakers, airport planners, and regulatory authorities, serving as a foundation for effective noise management strategies. Concluding, the study highlights that immediate interventions are

necessary to mitigate noise pollution, protect public health, and ensure the sustainable development of Bandaranaike International Airport and its surrounding regions.

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