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Sound mapping and sound barriers for mitigating noise pollution in metropolitan areas in Sri Lanka

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Environmental noise is a worldwide problem. The increase in the number of vehicles in Sri Lanka results in high vehicular traffic which has become a major source of noise pollution in the country. Exposure to high noise levels for long periods may lead to serious diseases including low hearing sensitivity and mental illness. Hence, it is very important to identify noise sensitive places in order to protect the general public and to facilitate policy decisions. Therefore, this study was aimed to identify the affects of noise pollution on the community, develop a sound map to identify the distribution of noise and to design sound barriers to mitigate noise pollution in metropolitan areas in Sri Lanka.

The Rajagiriya area was selected as the focal point of this study. A questionnaire was developed to gather information from affected people on noise. To investigate the peak hours of noise, noise levels were measured from 0600 - 2000 h using a noise level meter and the respective positions were recorded using a GPS monitor. A frequency analysis was done to identify the frequency levels of the noise sources in the area. Finally, a sound map was developed for the study area to identify critical locations. Further noise barriers were designed considering acoustical and structural considerations. Barrier dimensions, material, absorption ratios (ground and materials), transmission loss insertion loss, etc., were considered in the acoustic design.

The average noise level along the Kotte road was identified as 85 dB, while the highest noise level recorded in the area was 108 dB. The peak hours were identified as 1530 – 1845 hours on Monday. The results showed that most of the noise sensitive places such as schools, hospitals, government and private offices in Rajagiriya area are located within 80 - 75dB sound contours. Concrete walls of 2 - 3m height and 175 mm thickness could be used as noise barriers that can reduce noise levels to about 23 – 24 dB.

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