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## Environmental health issues associated with the disposal of municipal solid waste in Kurunegala

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Kurunegala is the capital of the Northwestern Province of Sri Lanka. It is situated about 116 km from Colombo, and 42 km from Kandy. The District covers an area of 4,816 km<sup>2</sup> which is 7% of the total land area of Sri Lanka and 61% of the province. The topography of the Kurunegala town is a plain area with the exception of surrounding rock outcrops. The northern part of the town is slightly higher than the south. The Kurunegala Lake adorns the town. The climate is tropical and hot all throughout the year. The surrounding rocks play a major role in determining Kurunegala's weather since these rocks increase and retain the heat of the day (WASPA, 2007). During the month of April the temperature can rise up to about 35 degrees Celsius. Major soil types are red yellow podzolic soil with strongly mottled sub-soil, red yellow low humid gley, reddish brown latosolic and regosol.

Kurunegala comprises of 30 Divisional Secretariats and 47 Grama Niladhari Divisions, of which 12 are within the Municipal Council (MC). The MC area is 11.34 km<sup>2</sup>. The Kurunegala MC is responsible for overall administration, sanitary, welfare, and other general activities of the city. The Kurunegala MC consists of a population of approximately 37,500. It has nearly 7,500 households and the daily floating population is more than 200,000. The average population density is 27.10 person/ha (JICA, 2008).

Municipal Solid Wastes (MSW) is one of the serious environmental issues in the Kurunegala urban area and is a result of rapid urbanization, economic and infrastructure development activities and population growth. Currently, unplanned and improper ways of dumping of solid waste have become the most significant environmental issue. The absence of a proper management of waste has a severe impact on the environment and human health. The most common practice in handling municipal waste is open dumping without any precautionary measures, which is a great threat to the environmental health. A

significant variance could be seen between diseases, distance and directions around the garbage dumping site.

The Kurunegala MC dumps 75 tons of solid wastes per day (MoE, 2005), collected twice from its territory and transported to the dumping yard at Sundarapola (2 km from Kurunegala City). The area of the dumping site is 12 acres. The site is high with rock type ground and it is slightly sloping towards the western direction. The northern part of the site consists of forest land. The open dumping and open burning of solid wastes are the present disposal methods which are not acceptable from an environmental point of view. These methods create a very serious health hazard to the area. The residents close to the dumping site (0-500 m) are the most affected and they are compelled to breathe polluted air with a nauseating smell of decomposed carcasses of animals.

The above condition leads to numerous environmental effects such as land and surface water pollution, spread of air, water and vector borne diseases, emission of toxic gases and leachate and odor and damage to the aesthetic beauty of the area. Further, it creates social disparity among the community. It is an urgent requirement to draw the attention of policy makers towards this serious issue. This study identifies the need of a proper solid waste management plan to resolve the problems and manage the surrounding environment in a healthy manner.

Considering the above, this study is designed with the prime objectives of identifying the environmental and health effects of the Municipal Solid Waste dumping site and to recommend effective managerial measures to safeguard its environmental health in a sustainable manner.

The data were collected through a questionnaire survey, observations, formal interviews and discussions with individuals and officials of the area. The study area was divided into three strata, based on the distance from the solid waste dumping site. The samples of households were selected randomly from each strata.. The stratified random sampling technique was used to collect household information. Secondary data also were used for the study. The SPSS statistical package was used to analyze the data and the two-way ANOVA technique was applied to obtain the required information to analyze the raw data and to evaluate the results.

The results obtained from the study indicated that the different types of health issues and its effects vary based on distance, direction and geographical factors. Accordingly, 58.2% of the people in the first strata, 30.1% in the second and 11.7% in the third strata are affected by various types of diseases. This shows a negative relationship between human health effects and distance from the site and the first strata (0-500 m) is most vulnerable for human lives.

Further, the result revealed that the health effect based on direction shows significant variances due to the geographical features of the sites. The health of 45.5% of the people in the south, 46.1% in the west and 7.4% in the east is adversely affected. The study shows that the inhabitants have been affected by stomach pain, headache, skin rashes, burning eyes, chronic cough, fever and phlegm, irritation, whooping cough, nausea, wheezing, diarrhea, sore throat, kidney disease and asthma. The above results clearly indicate that the wrong site selection greatly affects the health of those who are live around the dumping site.

Any environmental effects which have been caused by human activities cannot be eliminated completely, but can be controlled to a certain extent with the implementation of proper management practices, public awareness and strict implementation of laws. Therefore, it is necessary to formulate a suitable strategic plan pertaining to the MSW management (waste collection, transportation, disposal, site selection and site management) to ensure that MSW management services keep pace with socio-economically benefited and environmental friendly. In parallel, an extensive public awareness campaign is required to educate the public to reduce waste generation and manage waste at the house hold level.

**Key words:** Municipal solid waste, Open dumps, Environmental effects, Human health, Municipal solid waste management

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