

Abstract

This thesis describes the outcomes of a research investigation which was carried out to know the role of land use and rainfall characteristics in determining urban stormwater quality and to understand the process of stormwater quality management. The research investigation was carried out on the basis of selected urban land uses in Guwahati city, Assam, India. The methodology of generating the data needed for the study included a series of field investigations and laboratory testing. After the generation of data they were analysed using both univariate and multivariate techniques to know the role of land use and rainfall characteristics in determining urban stormwater quality.

The rainfall characteristics investigated were rainfall duration, average rainfall intensity and antecedent dry days. The result of the investigation indicates that, high average intensity rainfall event with long antecedent dry days would generate relatively high pollutant load and thus results in highly polluted stormwater runoff.

To know the relationship between land use and urban stormwater quality, stormwater runoff samples were collected from four different land uses namely residential, commercial, industrial and heavy traffic and tested for some primary stormwater pollutant parameters including nitrate, phosphate, total suspended solid, oil and grease and some heavy metals. The results of the study indicated that, the industrial and heavy traffic areas have more significant influence on stormwater pollution in comparison to residential and commercial areas. Total suspended solid is a primary stormwater pollutant and hence by reducing its concentration from stormwater the concentrations of other pollutants in stormwater can also be reduced to some extent.

Stormwater could be managed to some extent by implementing best management practices. Both the structural and non-structural best management practices should be used together to effectively manage the quality of stormwater runoff. The best management practices should select on the basis of the site conditions and the pollutants of concern for the specific site.