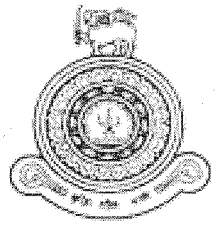

Case Study on Hazardous Chemicals in the Industrial Park, Kalutara

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Abstract

Sri Lanka uses many Acute Toxic Chemicals (ATC's) in industry, pharmacy, agriculture etc. These chemicals may cause hazards to humans and other living species when they are released to the environment freely. Formation of a toxic cloud is the characteristic feature of ACTs. Environmental parameters can highly affect the toxic cloud. Generally, it moves with the wind and gets dispersed in the environment. The wind pattern details obtained throughout meteorological sources reveal that, generally wind blows in three directions thought the year. The wind blows from the south west direction and the north east direction more than 70% of the year. According to the prevailing weather parameters in Sri Lanka, like, high solar radiation and humidity, high wind speed, ground roughness, tends to disperse the cloud in the environment very quickly.

The Kalutara Industrial Park was selected for this case study. Chlorine and Ammonia are the identified ACTs which exceed the TLC in Kalutara Industrial park. The maximum capacity of the chemicals at the respective plant site is, 8000 kg for ammonia, which is stored at a single storage point, and 300 Nos. of Chlorine filled cylinders of each capacity 900 Kg. "Technical Guidance for Hazards Analysis" published by U.S. Environmental Protection Agency and the computer programme "ALOHA" was used to model the VZ in the event of a release of these chemicals into the atmosphere. As the worst case scenario 9000 kg of ammonia can pose immediate danger for life and health to living beings at 0.7 miles radius while bursting of two chlorine cylinders, i.e., 1800 kg can pose immediate danger for life and health to the living beings at 0.6 miles radius.

In the event of a chemical release, baseline parameters of the environment also may change. To assess the effect of a chemical release, the initial pH and conductivity of the soil and ground water were tested. Due to the high precision of the pH value of the measured sample its value can be taken as a base line figure. But the conductivity values do not show that much of precision and hence it cannot be taken as base line information.

In order to mitigate these hazards, we must be able to understand the chemical, physical properties, its toxicity, and the dangers it may cause in handling, during transport, in storing, prevailing weather parameters, and also the geological and sociological pattern of the population.

It is interesting to note that, none of the above mentioned installations, have planned for a response to an emergency. Even the authorities who granted approval for carrying out productions in these plants had not evaluated the chemical hazards.