DEVELOPMENT OF A DECISION SUPPORT SYSTEM FOR LANDFILLING APPLICATIONS IN SRI LANKA

by

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Abstract

With increasing awareness of the harmful effects of solid waste mismanagement such as wild dumping, open burning and uncontrolled landfilling, many local authorities in Sri Lanka are now willing to invest in Engineered Sanitary Landfills. However, the lack of know-how and expertise is a general barrier for the rapid implementation of this approach in Sri Lanka. In addition, the expertise is not cheap when it comes to a narrow domain such as engineered sanitary landfilling and in most cases, local, authorities cannot afford to employ such experts, within their budgets

The aim of this research is to develop a decision support system that will help local authorities in Sri Lanka to better manage and implement the landfilling projects. A decision support system is computer program that provide expert advice as if a real person had been consul led. These systems capture and deliver knowledge that is not easily represented using traditional computing approaches. It could be used by Local Authorities in planning and implementing landfill facilities. It can training tool for the staff while avoiding the cost of living a human expert.

The central core of the knowledge base of BESTFill was acquired from the published text books and manuals. This knowledge consists of well established facts, rules, theory and guidelines that had been practiced over many years. The knowledge base was divided into four categories as site, technology, safety and post closure. The production rules were applied for the site related questions (site selection etc..) and objects or frames were used for other divisions namely technology, safely and post-closure.

A unique feature of BESTFill is that it contains several sub modules by while the user can obtain a comprehensive background knowledge on landfilling and integrated solid waste management. The sub modules were named as literature, info desk, training tool, photo gallery, landfill rapid assessment tool, economics &

costing, regulations and reports. As effort was made to make the system more user friendly, by using several user interfaces. The user not require process advantaged background in mathematical programming and computing methods.

The BESTFill decision support system was validated in two steps. The first step involved the internal validation of the system through program debugging, error analysis, input acceptance and output generations. The second step involved in validating the system under real application situation. The landfill site at Nuwara Eliya was considered as the most appropriate site for the field validation of the since it comprises the basic essential criteria of an engineered sanitary landfill.

BESTFill will serve as a guidance tool for landfilling applications in Sri Lanka. It is useful in planning, implementing, and trouble shooting at various stages of landfilling for the designers and operators. It helps the user to obtain every single aspects of the landfilling from the planning stage to the closure and post closure maintenance. The main beneficiary of the system will be the local authorities in Sri Lanka, which amounts 311. In the developing process it has been specially taken into consideration by analyzing the requirements, capabilities, weakness of the local authorities as the main largest group of the system.