Abstract

Background

A rural village in Thailand has always been limited in access to waste collection services and processing facilities. As a result, their behaviors of disposing waste in ineffective manners such as dumping and burning causes a variety of environmental impacts. In addition, the people dwelling in these areas are often unaware of the health risks associated to these types of engagements because of the inadequate education system. For a long time coming these circumstances remained untouched until a non-profit organization recently shed light to the need for a solution. An investigation, to develop a design solution in order to minimize the environmental and health impacts of waste in the developing village, is reported here.

Results

An adaptable, modular, sustainable, and appropriate design (called an Integrated Waste Management System) is the most advantageous system for minimizing the solid waste pool effectively by 71%. The system includes integration of appropriate waste management strategies, such as the utilization of incinerators, applications of enhanced anaerobic processes, and addressing root causes of the problem by educating the people among other treatments.

Conclusions

After theoretical analysis, confirmed by a system simulation model, the system design is capable of satisfying the problem constraints and parameters. The profit potential for the system is approximately $7,000; and the Social Return on Investment includes decreasing health problems, extending the lifespan, and conservation of natural resources.