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Outlook On: A Decision Support System for Sustainable Waste Collection

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Opinion

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Earth, home to various ecosystems is being exploited by improper waste management techniques. Waste management is crucial in today's era. The major problem of solid waste management is improper collection of waste and its disposal which leads to degradation of environment and pollution. The sustainable approach has three pillars economic, social and environmental which is necessary for this ever-changing world. The DSS is decision support system which is sustainable method for waste collection. The main concern of DSS is the organization of waste management which tends to saves the environment. From each garbage truck there are emissions of greenhouse gas which tends to pose a great threat to environment. Each garbage truck utilizes near about 30,000 liters of diesel per year. The manual routes and plans employed for collection of waste is more mechanical whereas DSS employed for waste management tends to make routes in shorter way. As manual designed routes include various factors like working hours of driver, capacity of truck, finding a route etc. The DSS organizes the routes and fixes the shorter distance for garbage trucks which makes the work easier and it's ecofriendly to an extent. The consequences of this DSS saves 21,300 kg of carbon dioxide and 187 kg of nitrogen oxides per year of truck. It lessens the operating time of truck by 25%.

It is estimated that by the year 2047 quantity of waste will be generated 260 million tons per year. Therefore, there is a dire need for the sustainable waste management techniques. Waste has various ill effects on health for example respiratory problems, growth problems. The person who is collecting the waste is more prone to skin allergies, blood infections etc. The contamination of soil, water, air by improper disposal of a waste leads to degradation of environment to a greater extent. It adversely affects the local economy, health and sanitation of people. It disturbs the animal and marine life too. In short, it is killing the planet in enormous way [1].

As the era is advancing, there should be adoption of smart waste management techniques. The old system of collecting waste aims at manual collection of waste in which garbage truck drivers are collecting at regular or weekly basis. There should be development of sensor-based technology to collect waste. The DSS will tends to finalize the shorter, most appropriate routes, its start and end point of waste collection. It will tend to form a smart city. This approach is ecofriendly and greenhouse gas emission reduces to great extent. The system architecture of DSS includes long and short-term planning. The long-term planning correlates with municipality in which garbage bins are equipped with sensors. In short term planning there should be truck driver coordinator, will coordinate with other truck drivers through mobile app in which they are guided with most appropriate routes to collect and dispose the waste. Residents of place are instructed to dispose the biodegradable and non-biodegradable waste in separate bins [2].

It permits to form a scheme that quantity of waste and other refuse needs to be sent to various treatment plants for reuse and recycling of products. It takes into account sanitary landfill conservation, requirements of incineration and balance of mass of waste. It is very popular n Genova and Italy [3].

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DSS system takes into account of proper mathematical calculations and models which helps the system to run in a smooth way. It includes databases which manages to perform the operations of the system in a systematic way [4].

The ReFlows is the model of DSS for waste management. This imitates financial and physical flows in the management of solid waste. It is very efficient model which computes exact recycling performance and tells about proper recovery production. This information is gathered by various source separation ventures at different levels includes local, regional and national. It comprises of various segments like generation of waste, separation of source, unit of composting, incineration or recovery of energy and last segment is disposal of waste known as landfilling. All these segments are separated though joined by one common means. It is known as model structure. The collection segment is the source in which materials got separated into packaging products, newspapers, magazines, organics, other recyclables, other special waste. It is based on MATLAB engine and its user will utilizes spreadsheets. This tends to be environment friendly [5].

The DSS settles the issues like lessens the communicable diseases, various new techniques employed to reduce environmental waste, saves the environmental resources. It helps to manage solid waste management system in which mathematical modules and databases are installed [6].

I hold powerful opinion waste management is need of an hour. It leads to various health issues and environment degradation. Therefore, it is necessary to dispose the waste in proper manner. There are various methods by which waste is disposed like composting, recycling and landfills. There are manual ways by which the waste is disposed by the garbage truck drivers which contributes to greater emissions of greenhouse gas. This happens due to longer route of drivers. In this advancing era, adopting the sustainable approach to treat waste management is through the system of DSS (Decision Support System). This system helps in fixing the route for collection and disposal of waste. By using the sensor technology in DSS, it manages to tell the driver about start and end locations. So, DSS is useful tool in waste management.

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