

Towards garbage separation between household wastes and business wastes in Bangkok; An alternative to improve garbage collection for sub-street areas

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Despite the continuing effort of Bangkok's government in trying to launch solid waste treatment projects while promoting garbage source separation in households, the current garbage collection system needs to be improved to guarantee the success of source separation projects which requires data monitoring and cooperation from households. According to a 2002 World Bank study, Bangkok has a waste generation of 1.3 kg/capita/day, as high as Tokyo and Hong Kong due to non-household sources. The current garbage collection system is a mixed collection of non-recyclables, recyclables, and hazardous materials of both household and business waste being collected together. As a long-term plan towards successful source separation in all sectors, there is a need to set up separate garbage collection system of households apart from the collection of business waste so that the actual amount of waste at each source can be measured. Knowing how much waste household and business sectors produce can lead to accurate reference data for policy making, monitoring of the results of projects and above all, gaining trust from the citizens to cooperate with garbage source separation programs.

The objective of the research is to develop a separate garbage collection system between household waste and business waste by focusing on establishing a system for household waste collection. Two sets of questionnaires, one at households and the other at district offices, were conducted to gain an understanding of the current situation. The majority of households live in sub-street areas, where garbage collection is carried out once a week, while business waste on the main streets are collected daily. The collection of sub-street waste is said to be time and cost consuming. 5-ton compactors have difficulty getting into narrow sub-streets and households often park their cars in front of their houses. Thus 5-ton compactors cannot go into the areas and the collection must be carried out on foot, which causes a delay or the skipping of the collection. Bangkok district is selected as a study area and the proposed system is developed towards the implementation in the district.

The research proposed the use of smaller vehicles to collect waste within sub-streets and bring it to the main street for 5-ton compactors to collect. Equations and simulation models are the tools in choosing the best vehicle out of 3 alternatives. The best scenario is to have pickup trucks, which are more cost effective and practical than either motorbikes or bicycles, making once a week collection of non-recyclable waste and once a month collection of recyclable and hazardous materials. The proposed system allows sub-street waste to be collected without mixing with main streets waste through the organizing of ten 5-ton compactor trucks to collect only household sub-street waste while the remaining vehicles collect business waste. The total cost of the new system is 13% more expensive than the current cost of mixed collection system, but it provides 10% more collection capacity, which can help solving the serious problem of uncollected waste within the district. The proposed system can lead to household's satisfaction since the delaying or the skipping of collection and the noise from compactor trucks is eliminated. The proposed system also provides separate collection of recyclables and hazardous waste, which can increase the recycling rate by 4 times from the current mixing source rate of 3.48%.