

Comparative Analysis of Solid Waste Management in Ulaanbaatar, Mongolia: Sustainability Assessment and the Implication

(モンゴル共和国ウランバートル市の固形廃棄物管理の比較研究：持続性アセスメントとその意義)

北海道大学大学院 環境科学院 環境起学専攻 国際環境保全コース
Byamba Bolorchimeg (ビャンバ・ボロルチメグ)

Waste related issues are one of the most significant by-products of urbanization and their proper management is one of the key challenges of modern life mainly due to the changing concept of waste. An ever increasing population growth, consumerism patterns and demand, rapid extraction of natural resources and lack of effective waste treatment methods are the main causes of current waste related problems. Especially in low income countries this issue is becoming more critical than ever, involving higher rates of open dumping, increased number of waste pickers, and thus increased risk to human health and to the environment.

Indeed, Ulaanbaatar (the capital city of Mongolia) is facing serious problems related to solid waste management (SWM). The rapid economic growth and rural to urban migration, especially dominance of the “*yurt* or *ger* (traditional nomadic felt dwelling structure) areas” in the outskirts of the city, are some of the major contributors to waste related problems due to the lack of management capacity and effective methods of regulation. The recycling initiatives are almost non-existent due to the lack of recycling facilities within the country, excluding some private small businesses that are nearly insignificant in size; but on the other hand, the informal and private sectors are growing in size and in degree of eliminating recyclable materials from the landfill sites and streets.

This paper presents a systematic assessment and comparative analysis of solid waste management in Ulaanbaatar, Mongolia. In this study, a recently developed UN-Habitat city profile methodology is applied, which addresses three physical components (public health, environmental control and resource management) and three governance strategies (inclusivity, financial sustainability and institutional coherence). Solid waste management issues are universal, despite the diverse and varying nature of city specific problems. It is important to adopt and adapt good practices of other cities with similar features while enhancing the given strengths. Therefore, comparing Ulaanbaatar with other cities will give a comprehensive analysis in addressing its strong and weak points. The cities’ comparative analysis consisted of waste generation rates and composition data, process flow diagram, followed by the calculation of the sustainability index according to the benchmark indicators. Ulaanbaatar city’s case was compared with 20 reference cities and Bahrain, and Sapporo, Japan as a fresh insert.

The analysis showed that the sustainability index values of cities varied from a low of 0.41 to a high of 0.92. Ulaanbaatar’s score was 0.63. The resource management, inclusivity and financial sustainability indicators were evaluated as the lowest, while public health, environmental control and institutional coherence were the highest. Financial situation is one of the critical points of SWM in Ulaanbaatar, where only around 42% of the *yurt* area’s residents pay the waste collection fee.

The 3 lowest scoring indicators - resource management, inclusivity and financial sustainability were further examined for formulating policy recommendations and alternatives. During the field work, interviews and public surveys were conducted with many of the stakeholders, including local authorities, formal and informal sectors, community based organizations and donor agencies. The public survey results showed that the socio-economic conditions of citizens residing in these two areas of residency, *yurt* and apartment are quite different. Surprisingly, relatively poor *yurt* area’s citizens are subject to pay more amount of waste collection fees than the apartment area. The study showed that waste management policies should reflect not only economic perspectives, but also social aspects of the current situation. Waste composition results showed that the fraction of recyclable materials like paper, plastics, metal and glass is around 40%, which indicates that the actual extraction of recyclables is relatively lower - only 4.8% is being recovered mainly by the informal sector.

A governmental subsidy and revision of the uncollected fee of *yurt* areas could be a good start in terms of breaking the vicious cycle of financial instability and poor collection coverage. The financial sustainability could then in turn affect the satisfaction level of the residents through improved collection services. The collection fee of *yurt* areas needs to be reviewed considering not only the economic perspectives, but also the social aspects. Therefore waste collection fee revision was estimated based on the cost and revenue analysis. Also, effectively integrating the informal sector into the municipal solid waste management system could be a promising approach for creating more job opportunities and recovering more recyclable materials through effective cooperation while benefiting the overall sustainability. Installation of recycling facilities should be further studied due to the already existing market of recyclable materials in order to maximize the economic benefit while creating more job opportunities. Citizens also could play an important role in the SWM, though public education related to waste management is poor. Hence the public awareness and participation initiatives should be actively promoted in the policy making for SWM. Based on the study results, community based organizations could be the key players of promoting the involvement of citizens and effectively linking the gap between policy makers and the public, especially in the *yurt* areas.