



International Conference on Solid Waste Management, 5IconSWM 2015

## Municipal Solid Waste Management in Ho Chi Minh City, Viet Nam, Current Practices and Future Recommendation

R. L. Verma<sup>a,\*</sup>, G. Borongan<sup>a</sup>, M. Memon<sup>b</sup>

<sup>a</sup>Regional Resource Centre for Asia and the Pacific, Asian Institute of Technology, KlongLuang, Pathumthani, Thailand

<sup>b</sup>International Environmental Technology Centre, United Nations Environment Programme, Osaka, Japan

---

### Abstract

Management of solid waste, including the municipal solid waste (MSW), is a major challenge in urban regions of most part of the world, including Southeast Asia. Due to the lack of effective management programs, regulations, and policies; the waste is causing severe health hazard including several communicable diseases, bad odors, nuisance, and environmental impacts, such as, contamination of water, soil, and air. Most Southeast Asian cities are lacking efficient MSW management programs. Thus, in order to contribute to building a good dataset on MSW for the Southeast Asian region, we quantified solid waste generation and analyzed waste composition for Ho Chi Minh City. Ho Chi Minh City is a major urban region of Viet Nam in Southeast Asia. In Ho Chi Minh City, about 8,175 tons of solid waste was generated per day in 2014, consisting 6,800-7,000 of MSW, with 1.02 kg/capita/day generation of waste. The trend in MSW generation from 1992-2010 showed that 98,338 tons of MSW has been increasing every year. The MSW of Ho Chi Minh City contains 65-90% biodegradable matter. The major portion of MSW was food waste from 1.4 million households, 1,837 schools, and 12,000 hotels and restaurants. The current common practice of solid waste management in Ho Chi Minh City is landfilling. About 86% of the total solid waste was landfilled at two major landfill sites (PhuocHiep and Da Phuoc), and the rest 14% waste was recycled. Paper, plastic, metals, glass were the major waste being recycled with a quantity of 3364, 3794, 1124, and 384 tons/month, respectively. Further to support the MSW planning in Ho Chi Minh City, we analyzed gaps and SWOT (strengths, weakness, opportunities, and threats) and provided recommendations to be incorporated in the action plans for efficient management of solid waste in Ho Chi Minh City.

© 2016 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of the organizing committee of 5IconSWM 2015

*Keywords:* Municipal Solid Waste Management, Solid Waste Composition, Landfill, Gaps Analysis, SWOT Analysis Southeast Asia, Ho Chi Minh City;

---

\* Corresponding author.

E-mail address: [ramlalverma@hotmail.com](mailto:ramlalverma@hotmail.com)

## 1. Introduction

Municipal solid wastes (MSW) are unwanted materials or wastes primarily generated from households including the offices, hotels, shops and shopping complexes, schools, institutions, and from municipal services, such as, street cleaning and maintenance of parks, gardens and other recreational areas. The major types of MSW are food wastes, paper, plastic, rags, metal and glass, with some hazardous household wastes, such as, electric light bulbs, batteries, discarded medicines and automotive parts. Management of MSW is a major challenge in urban regions in most part of the world including Southeast Asia. Due to the lack of effective management programs, regulations, and policies; waste is causing severe health hazards including several communicable diseases, bad odors, nuisance, and environmental impacts, such as, water pollution, soil pollution, and air pollution, if the waste is burnt in an uncontrolled manner. Most of Southeast Asian Cities are lacking policies, regulations, basic-infrastructure, and efficient MSW management programs (UNEP, 2004).

With rapid industrialization, urbanization, economic growth, and increasing population with their higher income and better lifestyle, the quantity of MSW and problems associated with solid waste are becoming a serious problem in Southeast Asia (Dhokhikah and Trihadiningrum, 2012). The generation of MSW in Southeast Asian mega cities is a large in terms of volume. For examples, the MSW generation was 8778 tons/day in Bangkok (Udomsri et al., 2011), 6000 tons/day in Jakarta (Mangkoedihardjo et al., 2007), and 3799 tons/day in Kuala Lumpur (Saeed et al., 2009). *These cities, in general, are not having enough facilities to manage such huge quantities of MSW. This in turn, results several problems related to health and environment, such as, spreading communicable diseases, bad odors, nuisance, water pollution, soil pollution, air pollution, and others.*

Limited studies have been conducted on MSW management in Southeast Asia in general and Viet Nam in particular. *The Asian Productivity Organization (AOP) published a report on Solid Waste Management: Issues and Challenges in Asia in 2007 (<http://www.apo-tokyo.org/>). This report included a chapter on Viet Nam, which pointed out that the management of MSW, to a certain extent, is inadequate, particularly in urban regions of the country. The report stated that there were practices of uncontrolled and long-term storage of waste, disposal site, non-engineered landfills, and use of waste to fill-up the vacant areas. These practices have resulted in the percolation of water soluble hazardous components of the waste to the groundwater and contaminating the groundwater. The discharge of waste without adequate treatment in waterbodies, such as the rivers, is causing a contamination of surface water which is making the water unusable for drinking and becoming harmful to aquatic life. Open burning of the waste affects the air quality of the region. The chapter on Viet Nam in the above mentioned report was focused on four provinces/cities, namely, Hanoi, HaiPhong, Hai Duong, and QuangNinh. Ho Chi Minh City, which is the largest city in Viet Nam, in terms of population and area, was not included in the report. Therefore, in order to build a good dataset on solid waste management, pertaining waste generation and composition, along with management practices, such as, transportation, landfilling, recycling, and composting; the present study is focused on Ho Chi Minh City.*

In this study, we quantified solid waste generation and analyzed its composition in order to propose appropriate methods of management. Further to this, we analyzed gaps in regards to waste management regulation and economic policies, institutions arrangements, technologies and infrastructure, capacity building, participation of stakeholders, and financing mechanism. Following this, we made analysis of SWOT that includes the Strengths, Weaknesses, Opportunities, and Threats in the management of MSW. Based on gaps and SWOT analyses, we proposed several recommendations to be incorporated in the action plans of Ho Chi Minh City for efficient management of the MSW.

## 2. Ho Chi Minh City

Ho Chi Minh City, popularly also known as Saigon, is located in the transition zone between South-East and South-West of Viet Nam, consisting 24 districts (19 urban or sub urban and 5 rural) with a total area of 2,095,06 km<sup>2</sup> (Figure 1). The metropolitan area of Ho Chi Minh City is greater than Hanoi, the capital city of Viet Nam. The City is a center of culture, economy and education. It is the most populous city of Viet Nam with a population of 7.98 million comprising more than 8 percent of the country (Statistical Handbook of Viet Nam, 2014). Due to the

Download English Version:

<https://daneshyari.com/en/article/4401364>

Download Persian Version:

<https://daneshyari.com/article/4401364>

[Daneshyari.com](https://daneshyari.com)