CHAPTER 1

INTRODUCTION

1.1 Introduction

Industrial and hospital wastes constitute a larger part on what is known as 'hazardous wastes'. The production of these wastes is and will continue to be an on going phenomenon as long as human civilization persists. Worldwide, the management of hazardous waste has received much attention since the early 1980s mainly due to its toxicity and infectious nature. Although no precise definition of 'hazardous wastes' has received wide acceptance, hazardous substances are considered to be those substances harmful to the health of humans, other organism and the environment. Today there are sufficient epidemiological evidences, which strongly support the connection between public exposure to hazardous waste and diseases. The health impacts of direct and indirect exposure to hazardous wastes include: carcinogenic, mutanogenic, and teratogenic effects, reproductive system damage, respiratory effects, central nervous system effects, and many others.

In developing countries, hazardous waste have not received sufficient due attention. In many countries, hazardous wastes are still handled and disposed of together with normal domestic waste and thus posing a great health risks to municipal workers, the public and the environment. Thailand, like many developing countries, has little emphasis on the proper handling and disposal of hazardous waste. The major sources of hazardous waste in the country are industrial activities, medical services and agriculture (use and disposal of expired agrochemicals)

Healthcare waste includes all the waste generated by health care establishments like hospitals, research facilities, and laboratories. Between 75% and 90% of the wastes produced by health care providers is non-risk health care waste, comparable to domestic waste. The remaining 10 to 25% of health care waste is regarded as hazardous and may create a variety of health risks. Infectious waste may

contain any of a great variety of pathogenic microorganisms. Pathogens in infectious waste may enter the human body through a puncture, cut in the skin, mucous membranes, inhalation and digestion. Hazardous health care waste causes fatal diseases. Major diseases are AIDS, hepatitis B and C. The viruses of above-mentioned diseases are generally transmitted through injuries from syringe needles contaminated by human blood. Sharps may not only cause cuts and punctures but also infect these wounds if they are contaminated with pathogens. Because of this double risk of injury and disease transmission sharps are considered as a very hazardous waste class. Hypodermic needles constitute an important part of the sharps waste category and are particularly hazardous because they are often contaminated with patients' blood.

1.2 Motivation

There are 1,386 hospitals and medical cares spread over in our country. This range from small size (fewer than 11 beds) to large size (more than 250 beds). Now a day hospital waste is one of the ascension problems in Chiang Mai. It has hazardous effect on the environment and its people. Establishment of various health care centers, clinics and hospitals has made this waste management difficult. Chiang Mai has 47 hospitals with a total of 6,810 beds. Of these, 26 hospitals with 2,541 beds belong to the ministry of public Health, and 7 hospitals are under other ministries. The private sector owns 16 hospitals with 1,810 beds. Chiang Mai province boasts 16 private hospitals, of which 15 are in the city and 1 in Hang Dong district. From government hospitals to private medical facilities, only a few health institutions are careful about how they manage such infectious waste. More than 90 percent of health cares do not practice safe waste handling; storage and disposal method and most health cares rely on municipal services for their ultimate disposal. Healthcare wastes such as biological waste, infectious waste, sharp, chemical waste, and hazardous waste are disposed along with municipal waste. Moreover, some hospital collect all medical wastes, including pathological waste, syringes, bandages and others, in a normal bin and dump it into the municipal containers, according to the preliminary study. Thus, the high risk of germ and disease is being widespread to affect the health and hygiene of each community and the environment in the city.

Waste is a change of form of a particular item from one shape to another. It is useful to the first user but with its transformation after use some of the items may be useful to subsequent users. If subsequent utilization is harmful, it should be removed with such precautionary measure keeping it out of reach for others. But, the trouble with throwaway society, like ours, is that there is no such place as "away". What we think we have thrown away is liable to come back to us.

Medical waste is responsible for serious health hazards. Though the persons involved in scavenging and housekeeping are handling are handling this aspect, the existing status of biomedical waste management cannot be said satisfactory due to many shortcomings and constraints. No specific guidelines and parameters are being followed or implemented by staff concerned. They are poorly educated and belong to the low category of workers, operating without proper and adequate guidance and supervision.

In order to prevent health hazard, proper hospital waste management and codification of its operational directives are required to be formulated urgently, which contain health risk. Chiang Mai is presently practicing random disposal of hospital wastes without any uniform standard and policy. There is no specific department for waste disposal with set procedure. The concerned officials are arranging disposal without ensuring and preventing its harmful consequences at the next stages.

In order to overwhelm the problems of medical wastes to the human health and environment, a proper and workable medical waste management system is a must in the hospital which including the determination of sources, waste compositions or characterizations, generation rates, handling practice, storage, transportation and final disposal. This paper addresses hospital waste compositions and management of general public hospitals in Chiang Mai province. The information and discussions are based on the survey conducted by the authors, the information from interviewing with hospital authorities and personnel involved in solid waste management, and the assessment and analysis of existing data.

1.3 Objectives

The objectives of this study are

1.3.1 To investigate quantity of generated solid waste from hospitals in Chiang Mai by type (medical, hazardous, domestic and recyclable).

1.3.2 To determine waste generated rate of hospital in Chiang Mai for providing waste minimization opportunity and international comparability.

1.3.3 To propose potential alternative options for the management of hospital waste regarding waste minimization.

1.3.4 To established benchmarking of hazardous waste management in hospital.

1.4 Scopes of work

1.4.1 In this work the Hospital Waste Survey was studied from private hospital in Chiang Mai Municipality area. The sampling was based on the grouping of hospitals by number of beds they have as shown below.

- Group 1: < 100 bed
- Group 2: 100 – 299 bed
- Group 3: 300 – 499 bed
- Group 4: > 500 bed

1.4.2 In Hospital Waste Survey, hospital waste were classified into 3 categories including medical waste, domestic waste and recyclable material (paper and corrugated cardboard).

1.4.3 A case study for Hazardous Waste Management was conducted at two general hospitals in Chiang Mai City.

1.4.4 The Hazardous Waste Management Study was an assessment on the use of hazardous materials, inventory, storage and handling, disposal and minimizes or reduces hazardous waste and hazardous waste management cost. Specific hazardous materials in this study included:

- Chemotherapy and antineoplastic chemicals
- Formaldehyde
- Photographic Chemicals
- Solvents
- Mercury

Other wastes were excluded from the scope of the assessment.

1.5 Expected benefit of this work

To provide hospital waste management guideline regarding to waste minimization. Moreover, benchmark of hospital hazardous waste will be established, which can then be use as a decision making tool for the future proper management of hospital waste.

1.6 Methodology

The methodology used to conduct this research included:

- Physical on-site inspection of hospital.
- Interview with hospital authorities and personnel involved in solid waste compositions and generation rates.
- Review hospital records.

1.7 Obstacle

The obstacles mostly were:

- Time constraint
- Lack of participation of the authority and people involved in this occupation
- Lack of information