



CHAPTER I

INTRODUCTION

Solid waste is a problem in most of the cities in the world. All human activities discharge wastes daily into environment, its quantity will increase gradually due to population and economic growth. Increased solid waste generation could cause much damage to the environment such as air pollution, and water pollution. It can effect the health of human beings (Huong, 1996).

The rapid pace of socio-economic development, urbanization and growth of population in most cities of the developing countries has caused an increase in the amount and complexity of municipal solid waste, and a greater demand for solid waste management. If the solid waste management system is carefully implemented, the environment pollution will be decreased. However, it is a difficult task to achieve this situation because of the increase complexity of human activities (Huong, 1996).

In Changwat Chachoengsao, solid waste was disposed incorrectly, e.g., open dumping, burning, and sending to the rivers or canal. Changwat Chachoengsao has changed in the context of high economic growth and rapid urbanization because of economic growth extension of Bangkok. Therefore, the amount of solid waste is increasing enormously and becoming a serious problem to the environment and public health of city.

In the present study, sanitary landfill is selected for solid waste management. Even though the sanitary landfill is a doubtful method because of the ever-increasing difficulty in finding land suitable. But the sanitary landfill is still an attractive method because of simple and safety.

1.1 The Study Area

Changwat Chachoengsao is situated in the eastern part of Thailand. It covers approximately 5,351 km² (3,344,375 rais) that lies between latitude 13°10' to 13° 59'N and longitude 100°50' to 102° 01'E. Changwat Prachinburi and Changwat Nakorn Nayok surround it to the north, to the east it is bounded by Changwat Prachinburi and

Changwat Sa Kaew, to the south by Changwat Chonburi, Changwat Chanthaburi, and the Gulf of Thailand, and to the west by Changwat Bangkok and Changwat Samutprakarn. The topographic maps at the scale 1:250000 are series no. ND 47-12, namely, Bangkok Metropolis. The topographic maps at the scale 1:50000 consist of 17 sheets, series L7017, namely sheets, 5336 I (Sa Thani Ban Kaeng), 5336 II (Khao Sung Bong), 5336 III (Ban Sam Pa Ngam), 5336 IV (Amphoe Ka Bin Buri) 5236 I (Amphoe Khok Pip), 5236II (Amphoe Phanom Sarakham), 5236 III (Changwat Chachoengsao), 5236 IV (Amphoe Bang Nam Prieo), 5235 IV (Amphoe Phanatnikhom), 5136 I (Amphoe Nong Chok), 5136 II (Amphoe Bang Bo), 5135 I (Changwat Chonburi), 5235 I (Amphoe Bo Thong), 5335 I (Khao Takrup), 5335 II (King Amphoe Kaeng Hang Maeo), 5335 III (Ban Si Raman), 5335 IV (Ban Tha Kloi). The study area is shown in Figure 1.1.

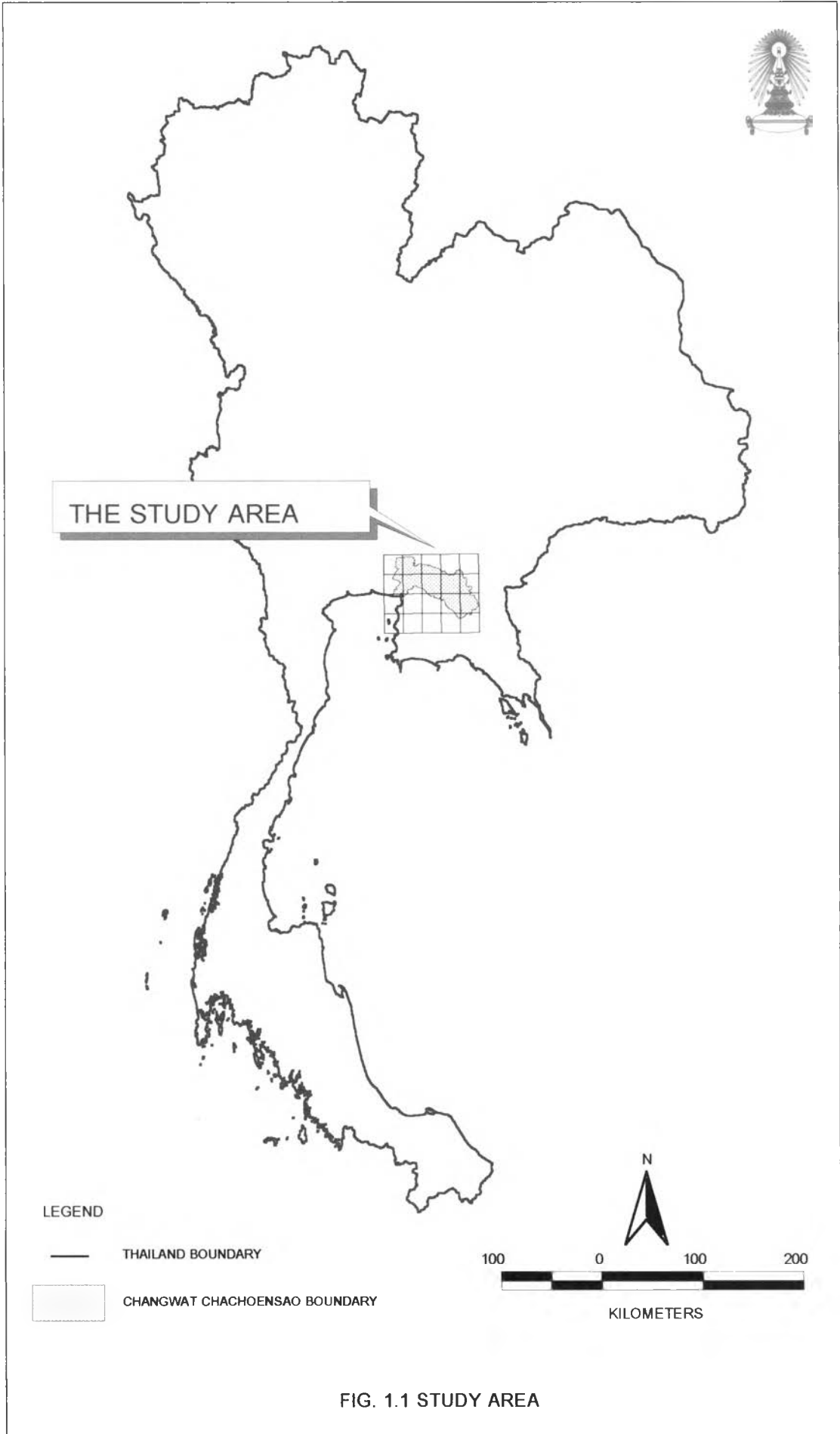
1.2 The Objective and Scope of Study

1.2.1 Objective of The Study

For the present study aims to acquire, to analyze, and to evaluate the physical environment parameters and the socio-economic parameters for identify the suitable areas for sanitary landfill of lifespan at least 20 years. The Geographic Information System (GIS) provides a broad range of tools for determining and analyzing suitable areas for sanitary landfill.

1.2.2 Scope of The Study

The scope of the study deals with five considerations. The first, to selects a most potential area for sanitary landfill in Changwat Chachoengsao. The second, the whole solid waste quantity is calculated from people who live in municipalities/sanitarries of Changwat Chachoengsao. The third, physical environment and socio-economic parameters are used for suitable areas and potential areas selection, respectively. The forth, the life span of landfill is at least 20 years. The last, GIS technique is selected to collect, to compiles, and analyzed data in the present study.



1.3 Methodology

Methodology of the present study can be divided into four main steps including data collection, preparation of database and analysis, field observation, and report. The schematic diagram for methodology system is illustrated in Figure 1.2, and will be described as follows:

➤ Data Collection

The first, the basic data acquisition, library researches, and literature studies are collected and arranged into data system. Each detail is summarized in Table 1.

➤ Preparation of Database and Analysis

The second, this step can be subdivided into three parts include land requirement calculation, preparation database and analysis using GIS technique, and potential area priority using weight-rating system.

➤ Field Observation

After the completion of analysis, some potential areas were selected for site observation.

➤ Report

Finally, the results have been presented in the forms of maps and tables. The results and discussion part cover decision on the potential areas for sanitary landfill.

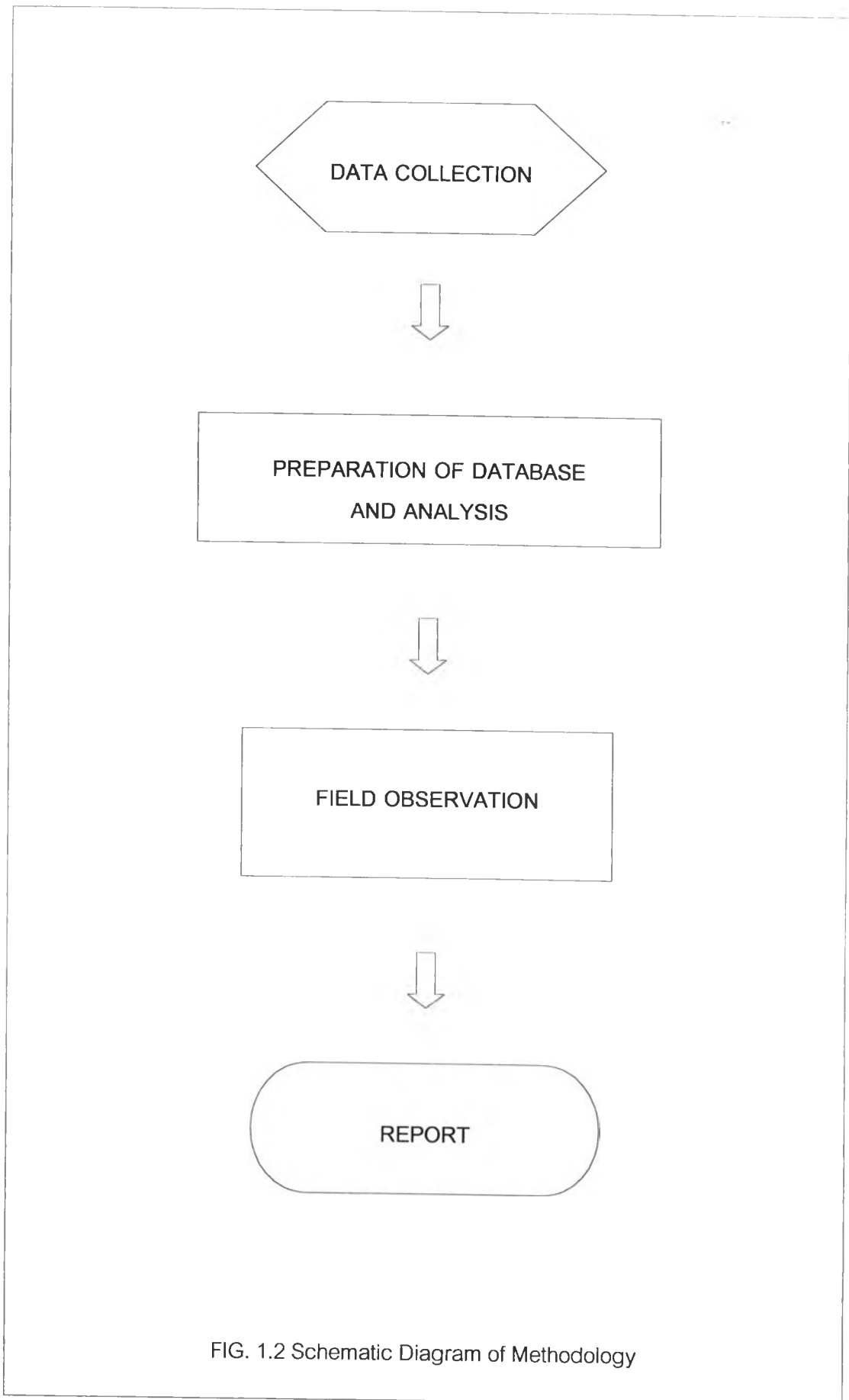


FIG. 1.2 Schematic Diagram of Methodology

Table 1 The Outline of Different Types of Data

Layer	Type			Scale	Year/Source	Quoted by
	Prim	Second	Result			
1. Population data		/		-	1983-1993	Team ¹
2. Statistic of General data of		/		-	1998	CC ²
3. Meteorological Data		/		-	1967-1999	MD ³
4. GW Observation		/		-	1958-1999	DMR ⁴ PWD ⁵
5. Topographic Map		/		1:50000	1970/RTSD ⁶	DEQP ⁷
6. Geological Map		/		1:250000	1976	DMR
7. Groundwater Map		/		1:100000	1996	DMR
8. Province, Amphoe Bound		/		1:50000	1970/RTSD	DEQP
9. District Bound		/		1:50000	1985/DOLA ⁸ , NSO ⁹	DEQP
10. Village		/		1:50000	1970	DEQP
11. Municipal / Sanitary Bound		/		1:10000	1989	DEQP
12. Slope Map		/		1:50000	1970/RTSD	DEQP
13. Contour Map		/		1:50000	1970/RTSD	DEQP
14. Stream		/		1:50000	1970/RTSD	DEQP
15. Watershed Map		/		1:50000	1975/DMR	DMR
16. Water body		/		1:50000	1975/DMR	DEQP
17. Soil Map		/		1:100000	1975	LDD ¹⁰
18. Geomorphological Map		/		-	2000	Lowiratsuthi ¹¹
19. Forest Use Map		/		1:50000	1992/ RFD ¹²	DEQP
20. Landuse Map		/		1:50000	1993	DEQP
21. Recreation and Tourism Attraction Map		/		1:50000	1992	DEQP
22. Transportation		/		1:50000	1992/DEQP	DEQP
23. School		/		1:50000	1995/DEQP	Thesis
24. Mod ¹³ . Geological Map	/			1:250000	1976/DMR	Thesis
25. Mod. Geological Resource. Map	/			1:250000	1976/DMR	Thesis
				1:50000	1980/DMR	DEQP
26. Mod. GW Aquifer Type Map	/			1:100000	1995/DMR	Thesis
27. Mod. Expect GW Map	/			1:100000	1995/DMR	Thesis
28. Mod. GW Quality Map	/			1:100000	1995/DMR	Thesis
29. Mod. GW Contour Map	/			-	DMR/PWD	Thesis
30. Mod. Landform Map	/			-	2001	Thesis
31. Mod. Flood Hazard Map	/			-	2001	Thesis
32. Negative Map			/	-	2001	Thesis
33. Positive Map			/	-	2001	Thesis
34. Route Map			/	-	2001	Thesis
35. Suitable Areas Map			/	-	2001	Thesis
36. Potential Area Map			/	-	2001	Thesis

Team¹: Team Consulting Engineer Co., Ltd.

CC²: Chachoengsao Provincial Statistical Office

MD³: Meteorological Department, DMR⁴: Department of Mineral Resources

PWD⁵: Public Work Department, RTSD⁶: Royal Thai Survey Department

DEQP⁷: Department of Environmental Quality Promotion

DOLA⁸: Department of Local Administration, NSO⁹: National Statistic Office

LDD¹⁰: Land Development Department, Lowiratsuthi¹¹: Lowiratsuth et. al.,

RFD¹²: Royal Forest Department, Mod.¹³: Mod fied