

CHAPTER TWO

REVIEW OF LITERATURE

This chapter reviews the literature in three main areas along with a summary: (1) The knowledge of solid-waste separation, (2) The database information of Anusaowaree sub-district, (3) Relevant research.

2.1 THE KNOWLEDGE OF SOLID-WASTE SEPARATION

The Federal Ministry of Agriculture, Forestry, Environment and Water Management of Austria (2005) categorized the kinds of solid-wastes in a book of “A Guide to Waste Separation and Waste Prevention” into 6 types. A method to separate each type of solid-waste is different depending upon what kind of material they are. The solid-waste separation method can be summarized as follow:

Type 1: Waste Paper, Cardboard, Paperboard, Corrugated Board

Paper and cardboard should be always separated from other solid-wastes and put into a specific bin. Lists of wastes to be put into this bin are shown in Appendix C. There are a few important practices which should be applied during the separation process.

- Newspapers should be stacked and bulky material such as cartons or boxes should be folded or cut before putting them into the container.
- Used paper must not be torn to small pieces but sorted and bundled with rope; otherwise, the sorting process will be difficult to do.
- Paper clips, adhesive tapes, plastic and other packaging material should be removed from used paper before being disposed.

Type 2: Waste Glass

Clear glass and colored glass should always be separated from other kinds of waste and segregated between clear and colored glass. The lists of glass wastes which may put into the uncolored glass bin and colored glass bin are enclosed in the Appendix C.

The important practices about glass separation must be applied as below mentioned:

- Please separate clear glass and colored glass. If in doubt (e.g. in the case of light colored glass), always put the vessels into the colored glass bin.
- Please remove beer caps, crown corks, screw tops, corks, metal seals from waste glass before segregating.
- Do not break glass bottles but put them whole together in a specific bin.
- Earthenware or ceramic bottles must not be put into the glass bin, because it will disturb the glass melting and production.

Type 3: Plastic Packaging, Composite Packaging, Wood Packaging, Packaging Made of Textiles and Ceramic

In Austria, this kind of waste will be put into the yellow bin or the yellow sack; however, it's not only waste from plastic and composite materials but also packaging made of wood, textiles and ceramic which will be separated in sorting facilities.

The practices that should be applied to this kind of waste are as follow:

- Keeping separately only empty and clean packaging.
- Large quantities of “Styrofoam”(other kind of foam which is not in the form of bead, it used to cover or contain vegetables, fruits) should be kept separately and delivered to a waste collecting vehicle.
- Disposable PET Bottles should be pressed to saves space in the bins or sacks.

Type 4: Metal Packaging, Drinks Cans, Waste Metal, Iron and Steel Scrap, Small Metal Items

The following practices should be applied to all metal waste.

- If a drink can is too dirty, it should be cleaned coarsely.
- Taking out all residual waste and keeping only empty metal packaging and small metal items in the bin.
- Do not place bulky scraps, big metal items and appliances into or beside the bin, but deliver.

Type 5: Biowaste

Biowaste is all sorts of garden refuse such as cut grass, cuttings and pruning from trees, hedges and shrubs, dead plants as well as kitchen scrap that are fit for composting.

In Austria, biowaste is a good practice operated to reduce all residual waste from household and small waste; however, there are some tips that people must follow in order to take care the biowaste bin:

- Put your biowaste bin in a cool place in your kitchen which is within easy reach (e.g. under the sink) to avoid the contents becoming too warm.
 - Always close the compost bucket tightly to avoid flies.
 - Empty and clean the bin every 2–3 days in order to avoid smell problems.
 - Cover the bottom of biowaste bin with absorbent paper (kitchen roll, napkins, or newspaper), clean bin at regular intervals.
 - Wrap damp organic waste in paper (newspaper, paper bags).
 - Do not pour liquids into the bin.
 - Do not throw plastic bags into the biowaste bin.
 - If possible, put dry, rough material such as dry grass or leaves into the bin first.
 - Always dry garden waste, especially grass and wet leaves before putting in the biowaste bin.
 - Do not throw away the biowaste into the biowaste bin with a plastic bag.
- The biodegradable process in biowaste bin will produce the high quality compost which can be used as a soil for agriculture and planting.

Type 6: Problem Waste – Household Hazardous Waste

Due to being dangerous for human health and the environment, the problem waste needs to be treated with high environmental standard. A specific process is applied to manage with refrigerators, fluorescent bulbs, TV, etc. A suggestion for operating this kind of wastes is keeping in a safe place (far away from children and pets) and delivering it to the local waste collecting site.

In Austria, shops and stores are regulated by the legal obligation to take back the problem waste e.g. used batteries, fluorescent bulbs, toxic agents and their

packaging including refrigerators and freezers. The hazardous waste will be collected and returned to the manufacture for a suitable destroying process.

The list of wastes which are defined as the household hazardous waste is enclosed in Appendix C.

2.2 THE DATABASE INFORMATION OF ANUSAOWAREE SUB-DISTRICT

2.2.1 General Information of Anusaowaree Sub-District

Bangkheng District Office (สำนักงานเขตบางเขน, ม.ป.ป.ก) is comprised of 2 Sub-districts – Anusaowaree Sub-district and Tha-raeng Sub-district, which occupied the area of 17.005 km² and 20.280 km², respectively (map enclosed in Appendix D). However, the scope of this study will be the people who reside in Anusaowaree sub-district only.

Anusaowaree sub-district of Bangkok metropolis is located in the south of Sai Mai district, the north of Lad Phrao district, the west of Tha Raeng sub-district and the east of Don Muang and Lak Si district.

2.2.2 Population Information in Anusaowaree Sub-District

The population in Anusaowaree sub-district as of September 2007 is as follows (สำนักงานเขตบางเขน, ม.ป.ป.ข).

Male	amount	49,821
Female	amount	50,992
Total	amount	100,813

2.2.3 Community Information in Anusaowaree Sub-District

Bangkheng District Office divided all communities in Anusaowaree sub-district area into 5 categories. There are total 43 communities located in Anusaowaree sub-district which can be categorized according to the type of communities as follows (สำนักงานเขตบางเขน, ม.ป.ป.ค).

Crowded community	9	communities
Land development community	17	communities
Flat community	2	communities

Urban community	14	communities
Suburban community	1	community
Total	43	communities

2.3 RELEVANT RESEARCHES

The previous research investigating the factors affecting the solid-waste separation behavior is as follows:

Veena Chakratrayapong (วีณา ชัดตตรยาพงษ์, 2550) stated that the cooperation from people in community is an important factor making a community successful in the waste separation system. The local administration office should make people recognize the waste problem and give the right knowledge of waste separation to community people. Moreover, the government should encourage the local community organization and people to have more participation in developing their own community including building the public conscience of people leading them to have more responsibility to society than at the present.

Supakij Srisuchati (ศุภกิจ ศรีสุชาติ, 2540) found that there were three factors with effect towards the waste separation behavior – the readiness of people, occupation, and knowledge of information. The study showed that the majority of subjects in Muang Nhongkai district recognized the waste problem and agreed with having solid-waste separation bins, while 92.7% of 360 subjects had good behavior in waste separation. The study also reported that 66.9% of subjects had waste separation frequently.

Thamrong Mankhong (ธำรงค์ มั่นคง, 2544) explained the understanding, the attitude towards the solid-waste problem and the factors which effect people to accept the waste separation. His four important findings were briefly stated as follows.

1. Sampling group had the knowledge of waste management at quite a high level. They had the knowledge of solid-waste about positive and negative effect at a most level and about waste separation at least level.

2. Sampling group had attitude towards the waste separation at the moderate level; especially, attitude towards the effect of waste separation was at the most level. On the other hand, attitude towards the consistence of waste separation was at the least level.

