

CHAPTER 2

RESEARCH METHODOLOGY AND BACKGROUND OF RESPONDENTS

2.1 INTRODUCTION

This chapter describes the research framework of analysis, study design and background of the study site. The profile of respondents and other background information will also be presented.

2.2 FRAMEWORK OF ANALYSIS

This study analyses the awareness and attitude of the public towards the water usage and conservation. Generally, environmental research has attached very little attention to the central role and behaviour of human beings. Research has been carried out to assess the level of knowledge and awareness of various segment of population have on environmental issues, rarely is there understanding that the right knowledge can affect human behaviour (Tan, 2001). People need basic information to change their lifestyle. For example, the author of 'How To Be Green' said that once his book first published in September 1989, the proportion of people who say they want action on green issues has increased dramatically (Button, 1990). Furthermore, the understanding of the environmental connectedness can be liberating too, because it shows that we have the choice, to choose an environment-friendly course of action or an of environment

destructive action. Thus, human behaviour and action affects the living environment. Ultimately, the living environment¹ does affect the quality of our lives.

This study utilizes this basic research framework to measure knowledge and awareness and how people perceive the importance of their own roles and behaviour in conserving water. Participation of the people can only be effective if they understand the continuous destructions that can emerge from their own behaviour and even with their little action will make a difference. This is because when many individuals make the same decision about their own health and the environment well-being, and then changes will start to move at a deeper level.

Ecologist, Barry Commoner wrote 'The Closing Circle' (one of the Classics of Green Thinking) in 1971, he included a very simply formulation of the basic 'laws of ecology'. They are four clear and straightforward laws:

The first law is 'everything must go somewhere'. This law is the one to do the pollution. Whenever we throw something away, it doesn't disappear. Whether we put it in the bin, throw it out of the window or dump it in the middle of the ocean, we must live with the repercussions. Our planet is finite; a 'closed system'. Whatever we put our 'rubbish' it will continue to hunt us.

¹ Environment is one of the main measurements that is considered in the Malaysian Quality of Life Index (Economic Planning Unit, 1999).

The second law is 'nature knows the best'. This law warns us that we thwart and destroy nature at our peril, and that nature has been evolving excellent life-support systems for millions of years longer than human being have.

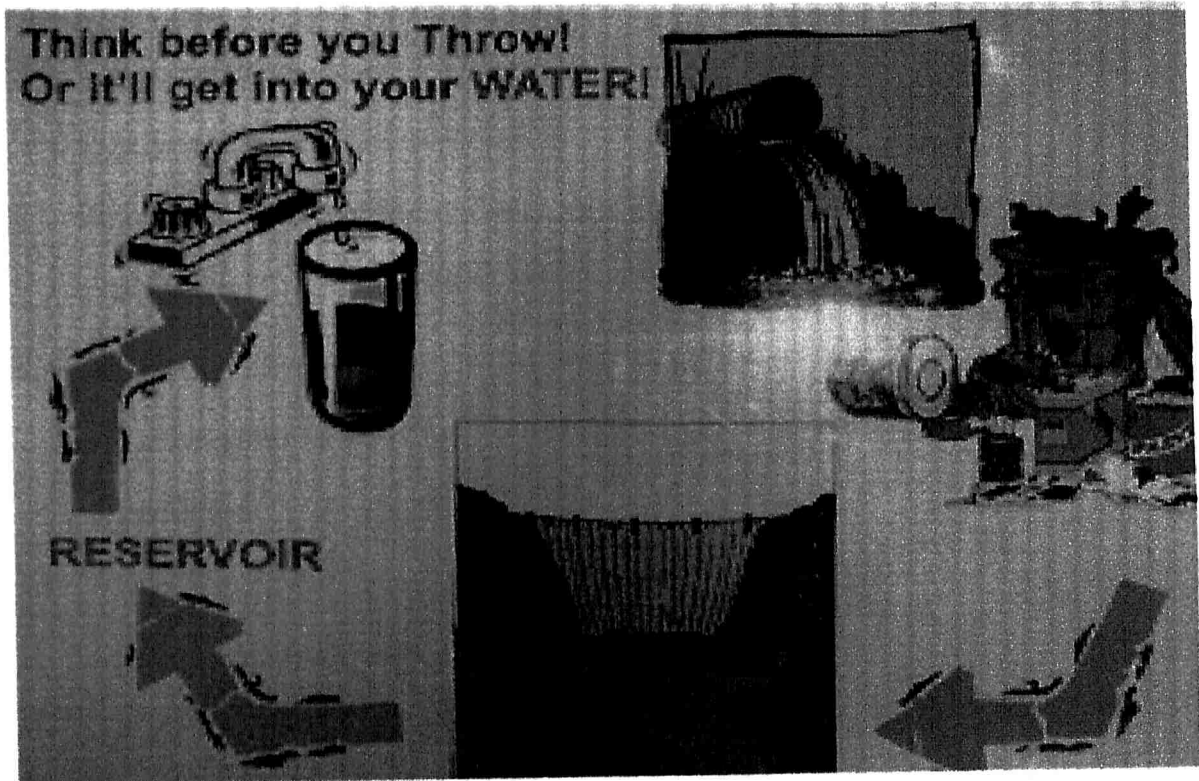
The third law is 'there's no such thing as free lunch'. This law makes it clear that everything we consume has an environmental and social cost. Though we might like to imagine that the luxuries of life simply appear before us without any provenance, it is a costly delusion. Up to now most people in Malaysia have been able to consume as they do at the expense of ignoring the continuing decline of their own health, that of their surroundings, and the chronic ill-health of the Third World. Today, however, the legacy of profligacy and pollution is hard to ignore.

Of the four, 'everything is connected with everything else', the last is the key and the one that helps us most to understand the others. Everything is connected to everything else. This is the philosophy and practice of holism, or holistic thinking, which says that you can never make complete sense of anything; unless you take into account all its circumstances and complex interconnections. Putting things in little boxes and refusing to look at connections will inevitably blinker our understanding and limit the possibility open to us (Button, 1990).

Figure 2.1 shows that whenever we throw the thing, it does not disappear. Our earth is finite and interconnection. Thus, the thing that we throw will ultimately come

back to us. We need to make connection of our decision and even though what we help the environment may seem small and insignificant, imagine that a difference it would make if everyone in country does it. The change has to start somewhere, and it might as well be with you.

Figure 2.1: Think Before You Throw



Establishing a sense of ownership and responsibility can only come with greater information and understanding that we have stewardship responsibility toward the earth. Water is a scarce resource but essential for our survival. It is necessary to meet our needs and requirements. We are aimed at minimal destruction of our natural environment.

This study will identify various demographic characteristics in relation to behaviour patterns and level of water conservation awareness and knowledge. Among some of the test are:-

- i. Higher education increases knowledge and interest in conserving water issues. Hence, education is an important component in encouraging water conservation;
- ii. Younger persons are more aware of environmental issues and hence more likely to be proactive in water conservation;
- iii. Ethnic groups have varying view on environmental issues. Hence, different ethnic groups are likely to respond differently towards water conservation;
- iv. Females are more conscious about the costs and budgeting and are more likely to pay attentive to conservation issues and hence have greater participation in water conservation.

2.3 RESEARCH DESIGN

Survey questionnaires were used to elicit the required data for the cross-sectional study. The survey was conducted in Section 17, Petaling Jaya by a group of undergraduates of University of Malaya in 1999. The students conducted this survey as part of their coursework to practice the skill of sampling design and data collection.

2.3.1 Sample and Questionnaire Design

Simple random sampling was applied to select a representative sample of 647 cases from a listing of all living quarters in the area. There was a total of 3,402 living quarters in Section 17, Petaling Jaya. The living quarters include single and double storey terrace houses, detached houses, flats and apartments, squatter houses, shop houses and others. All living quarters in Section 17, Petaling Jaya was considered as the sample frame, with the sample unit being the household or living quarters. The respondent was any member of the living quarters who felt able to respond.

Face to face interview were conducted with the use of a structured questionnaire consisting of a combination of both open and closed-ended types of questions developed to allow for uniformity and consistency throughout the data collection process (Appendix 2.1). The questionnaire obtained the background information of respondents, such as age, gender, ethnic group, marital status, educational level, occupation, household income, number of household members as well as type of living quarters. The questionnaire consists of 30 questions on water usage for daily activities and hobbies, and opinion on the water conservation which can be divided into three sections, namely:

- a. Attitude and awareness of water usage, including reporting water leakage.
- b. Water usage for daily household activities (laundry, bathing, brushing teeth, cleaning and etc).
- c. Opinion on various water issues.

2.3.2 Formatting Data Set and Cleaning

The completed questionnaires were checked again prior to coding. For the open-ended questions, a tally count of the answers was made before categorizing and determining the relevant codes. The information was entered into computer using Microsoft Excel and consistency runs were carried out to check the data for errors. The data set is then cleaned and prepared for analysis using SPSS statistical package.

2.4 METHODS OF ANALYSIS

Bivariate analysis is used to assess the importance of certain independent variables in relation to various dependent measures of knowledge and awareness towards water conservation. The independent variables cover various socioeconomic variables such as age, gender, ethnic group and education. The knowledge of respondents on water conservation measured by their knowledge on the cause of water shortage and water pollution, steps to prevent water shortage and water pollution, and the possibility of water shortage in future and the reason of water shortage. Attitude towards water conservation is measured by their self-perception on their own roles in preserving the water, in caring for public places and possible action taken to tackle the water issues.

To measure household behaviour towards water usage, the amount of water used each month is considered. For the computation of water usage in this study, the number

of household members includes everyone in the house, regardless of relationship. Those measures are cross-tabulated with background variables such as age group, gender, educational level, and ethnic group. The Chi-square test is used to test for differences across categories of various independent variables (Lohr, 1999 and Norcesis, 1997).

Apart from bivariate analysis, multivariate analyse is also utilized. For the first model, as the dependent variable is mostly dichotomous, that is associated with two qualitative choices, logistic regression analysis is used. Logistic is used when the dependent variable is binary, but can be useful for other dependent variables if they recorded to binary form. This technique transforms the problem of predicting probabilities within a (0,1) interval to the problem of predicting the odds of an event occurring, given a set of conditions. Logistic regressions predict likelihoods, measured by probabilities, odds, or log-odds (Sweet, et al, 2003). The odds describe the ratio of the number of occurrences to the number of non-occurrences.

The logistic regression model may be specified as follows:

$$P(Y_i = 1) = 1 / (1 + e^{-Z})$$

Where

$$Z = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + \dots + B_kX_k$$

Y_i is assumed to depend on k explanatory variables, X_k , $k=1,2,3,\dots,K$. The parameters of the model are estimated using the maximum-likelihood based on SPSS

logistic Regression procedure. The model Chi-Square value indicates whether the estimated coefficients are significantly different from zero, while the χ^2 Goodness of fit shows the fit of the model on the data.

Multivariate analysis would be used to explain participation in water conservation. In the first section, participation is measured by whether they will report the water leakage at public places. Socio-economic variables such as, gender, age, educational level and ethnic group, and perception of respondent on the possibility of water shortage in future would be used as explanatory variables.

Another multivariate framework would be used to look at the individual awareness of water usage in various selecting activities. Individual awareness of water usage is measured by whether respondent let the water run continuously when doing some daily activities such as, brushing teeth, washing face and washing hand. Thus, three multivariate logistic regression models are used to estimate the effect of the explanatory variables. Socio-economic variables such as, gender, age, educational level and ethnic group, perception of respondent on the possibility of water shortage in future, knowledge of the cause of wastage of water would be used as explanatory variables.

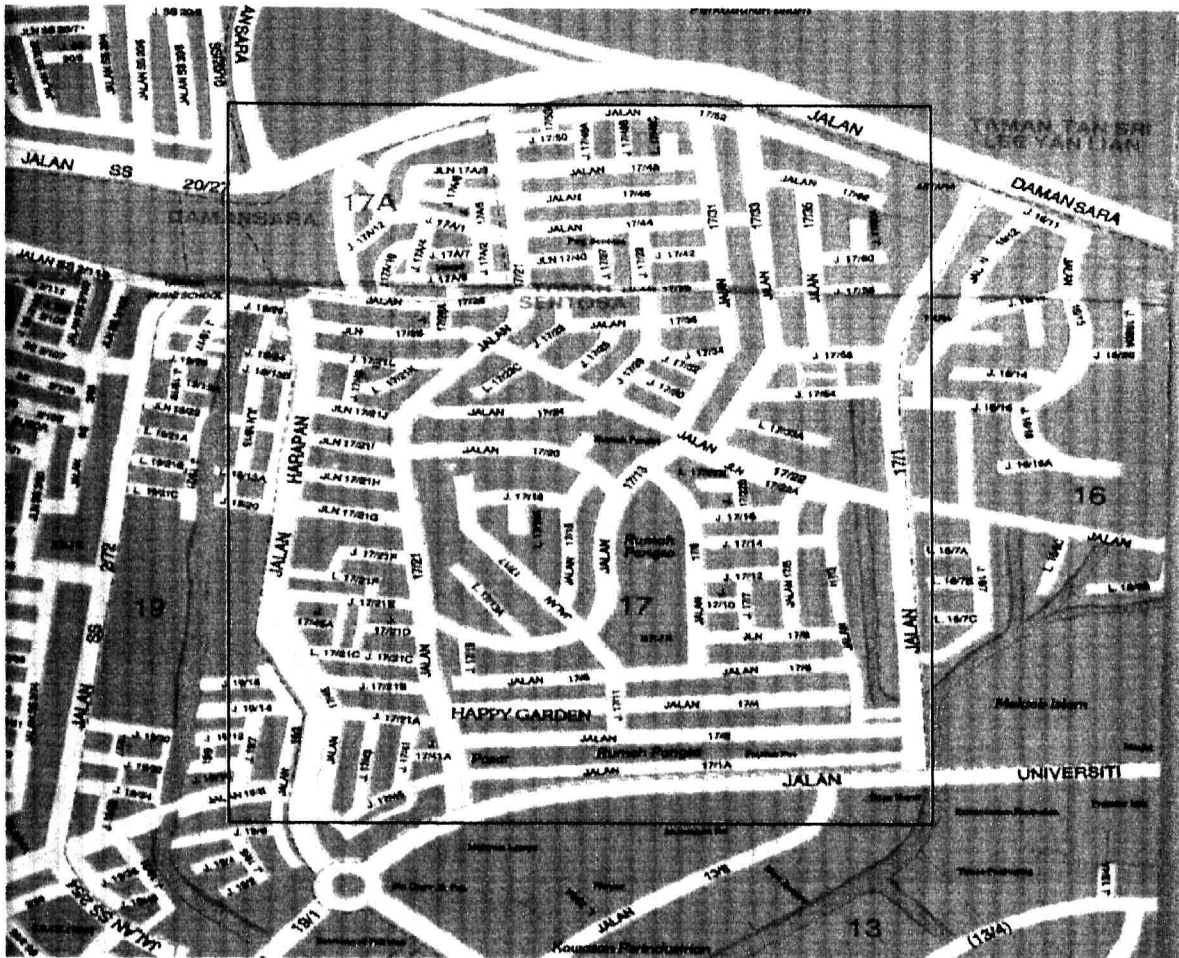
2.5 BRIEF DESCRIPTION OF SURVEY AREA

Section 17, Petaling Jaya abuts the Damansara Highway and forms part of the northern boundary of Petaling Jaya with a land area 420 acres and a population of 14,770 (PJNet Sdn Bhd, 2000). It is located less than 1 km west of Kuala Lumpur, the capital of Malaysia. It is under the administration of the Petaling Jaya Municipal Council (MPPJ) (Figure 2.2). It is one of the largest residential sectors in Petaling Jaya. The main mode of accommodation comprises terrace houses, apartments and shop houses. It is a favorite place for accommodation for students of University of Malaya students and International Islamic University. The major landmarks are Lisa De Inn hotel and a wet market. Section 17, Petaling Jaya is also known to many NGO's as the home for the Petaling Jaya Community Centre, a well established community-based organisation involved in environment and community activities.

2.6 PROFILE OF THE RESPONDENTS

This section provides a brief description on the profile of respondents. It highlights the socio-economic background of the respondents by addressing age structure, marital status, gender distribution, ethnic composition, educational level and income and type of living arrangements.

Figure 2.2: Map of Section 17, Petaling Jaya and S17A



The respondents in the sample consist of 298 males and 344 females and their ages ranged from 18 to 90 years old. On average, the age of the respondents is 39 years old. The distribution by 5-year age group shows that higher percentage of respondents at younger age group of less than 25 years old and at older age group, of 50 and above (Table 2.1). This may partly due to those two groups of people were more likely to be at home when the survey was conducted, compared to those in the age

group of 24 - 49, who were more likely to be at work. Five female respondents did not provide this information.

Table 2.1: Percentage Distribution of Respondents by Age by Sex*

Age Group	Male (%)	Female (%)	Total (%)
<25	19.5	26.2	22.6
24-29	13.4	13.4	13.4
30-34	11.3	7.7	9.7
35-39	10.5	9.4	10.0
40-44	10.5	10.1	10.3
45-49	6.4	4.4	5.5
50+	28.5	28.9	28.7
Total (%)	100.0	100.0	100
Number of cases	298	344	642

* Five females did not provide their ages.

The ethnic composition shows that Chinese make up 76 per cent of the sample, 14 per cent being Malays and 10 per cent are Indians and Others (Table 2.2). The majority of the respondents are educated, 44 per cent of them with secondary education and 42 per cent with tertiary education. This may partly due to the graduates from universities and colleges nearby choose to stay at Section 17, Petaling Jaya. Only a total of 14 per cent of respondents have no schooling or only received primary education. Males tend to achieve higher education than females. There are about 49 per cent of males have received the tertiary education compared to 36 per cent of

females. More than half of the respondents are currently married. Some 37 per cent are never married. This may due to the large student and working population. About 42 per cent of males are never married compared with 34 per cent of females.

Table 2.2: Percentage Distribution of Respondents by Sex and Selected Characteristics

Characteristics	Male (%)	Female (%)	Total
Ethnic Group			
Malays	14.8	13.2	13.9
Chinese	74.2	78.2	76.4
Indians and Others	11.1	8.6	9.7
Educational Level			
No School and Primary	6.4	20.6	14.1
Secondary	44.3	43.3	43.7
Tertiary	49.3	36.1	42.2
Marital status			
Never married	41.6	33.8	37.4
Currently married	55.0	62.8	59.2
Widowed or Divorced/separated	3.4	3.4	3.4
Total (%)	100.0	100.0	100.00
Number of cases	298	349	647

When the respondents were asked the household income, only 323 or half of the respondents answer the question. Respondents were quite reluctant to release the household income information or they are still students. The monthly household income ranges from RM100.00 to RM100,000.00. It skews to the right with the mean of RM3998.70 and median of RM2,500.00. Some 9 per cent of respondents report a

household income of less than RM1,000.00 per month. More than half of the respondents (57 per cent) are in the household income of RM1,000.00 – RM3,999.00

Table 2.3: Percentage Distribution of Monthly Household Income

Income Group	Total (%)
<1000	8.7
1000-1999	21.7
2000 – 2999	21.1
3000 – 3999	14.9
4000 – 4999	7.7
5000 – 5999	10.5
6000 – 6999	3.7
7000- 7999	2.2
8000+	9.6
Total (%)	100.0
Number of cases	323

The mean household size is 5.3 persons. Some 40 per cent of the respondents live in small household size, which consists of 1 to 4 persons (Table 2.4). The household size ranges from one to twenty persons. The 10-year age group shows that the youngest generation has the biggest household size, 6.2 persons. This is probably due to the students like to recruit more persons to stay together to save money for the rental of room or house.

For the ethnic groups, Indians & Others have the lowest mean household size, 4.4 persons compared with the Malays and Chinese. Those with tertiary educational

level are more likely live in the bigger household size compared with other counterparts. This may due to the fact that a lot of fresh graduates obtained the jobs in Klang Valley and share room or house with their friends. The mean household size for those who rent the room and house larger than those who stay with family or owned the house (6.6 persons versus 4.8 persons).

The main type of living arrangement comprises renting the house, renting the room and staying with family. Nearly 70 per cent of the respondents are staying with their families (Figure 2.3). About a quarter of the respondents stay in either rented house or room.

Figure 2.3: Type of Living Arrangements in Section 17, Petaling Jaya

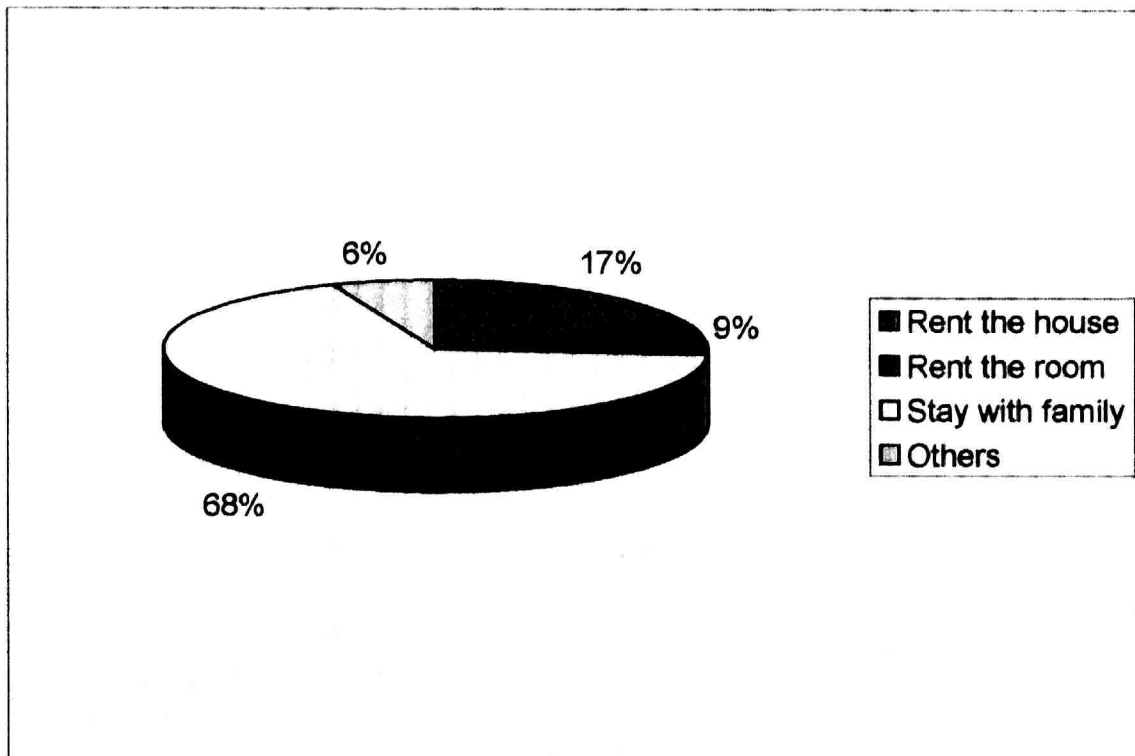


Table 2.4: Percentage Distribution of Respondents by Household Size and Various Characteristics and Mean Household size

Characteristics	Household Size				Total	n	Mean Household Size
	1-4 persons	5-6 persons	7-8 persons	9-20 persons			
All	39.9	38.3	11.8	10.0	100.0	642	5.3
Gender							
Male	43.6	34.2	11.7	10.4	100.0	298	5.2
Female	36.7	41.8	12.0	9.5	100.0	349	5.4
Age Group*							
< 30	29.0	36.8	16.0	18.2	100.0	231	6.2
30-39	46.0	39.7	8.7	5.6	100.0	126	6.0
40-49	28.7	49.5	15.8	5.9	100.0	101	5.0
50+	55.4	33.2	6.5	4.9	100.0	184	5.0
Ethnic Group*							
Malays	36.7	35.6	16.7	11.1	100.0	90	5.5
Chinese	38.3	39.9	11.3	10.5	100.0	494	5.4
Indians & Others	57.1	30.2	9.5	3.2	100.0	63	4.4
Educational Level**							
No Schooling and Primary	36.3	45.1	8.8	9.9	100.0	91	5.4
Secondary	43.5	38.5	11.3	6.7	100.0	283	5.0
Tertiary	37.4	35.9	13.6	13.2	100.0	273	5.5
Type of Living Arrangement*							
Rent the room or house	26.6	28.9	15.6	28.9	100.0	173	6.6
Stay with family or own the house	44.6	41.9	10.6	3.0	100.0	473	4.8

* Significant at 5 per cent level,

** Significant at 10 per cent level.

n = number of cases