CHAPTER FIVE
CONCLUSIONS, DISCUSSIONS, AND RECOMMENDATIONS

This chapter presents (1) a summary of the study, (2) a summary of the findings, (3) discussions, (4) conclusions, and (5) recommendations for further research.

5.1 SUMMARY OF THE STUDY

This study was designed to study the behavior of undergraduate university students in Bangkok in using plastic bags in respect of the global warming issue. Global warming is the phenomenon which has potent effects on every creature on Earth both directly and indirectly. The plastic bag issue is one of the main factors which can worsen the actual situation of the world.

5.1.1 Objectives of the Study

This study has 2 main objectives; (1) to measure the students' basic knowledge and understanding of plastic bags and global warming, (2) to find out the behavior of the students in using plastic bags before, at the time of, and after buying goods and in which conditional situations.

5.1.2 Subjects, Materials, and Procedures

5.1.2.1 Subjects The subjects of the study are undergraduate university students. The sample size of the study was planned to be 120 samples in the first place. However; 18 samples were not be counted due to invalid information given (incomplete and overcomplete questionnaires). Thus, the sample size was reduced to only the valid samples, which are 102 students. These students were limited to those who studied at Thammasat University, Chulalongkorn University, and Silpakorn University.

5.1.2.2 Materials The instrument used in the study was a constructed questionnaire of 22 questions, printed in Thai. The questionnaire is divided into 3 parts: (1) demographic data, (2) students' basic knowledge and understanding of

plastic bags and global warming, and (3) the behavior of the students in using plastic bags. The questionnaire had both closed-ended and open-ended questions.

5.1.2.3 Procedures The questionnaires were distributed and collected on the same day from the students of those universities and would take 5-10 minutes to complete. It took 2 weeks to distribute and collect all questionnaires. The data collection took place at the end of February 2008.

5.2 SUMMARY OF THE FINDINGS

5.2.1 Demographic Data

The majority of the subjects are female (71.6%). All respondents studied in 13 different faculties of the 3 universities, most of them are 4th year students (37.3%). The majority of the respondents (36.3%) had a monthly income or allowance of 10,001-15,000 baht, and for the daily expenses, the majority of the respondents (40.2%) spent 201-300 baht per day.

5.2.2 Knowledge and Understanding of Plastic Bags and Global Warming

5.2.2.1 Plastic is polymer substance acquired from chemical synthesis by taking monomer, the chemical compound of hydrocarbon in oil and natural gas. Ninety-two percent of the respondents knew that plastic bags are made from petroleum, a generic term applied to oil and oil products in all forms including natural gas liquid and natural gas. Only 2% thought that plastic bags were made from plants.

5.2.2.2 Plastic bags degradation period varies according to the conditions of how they are disposed. It can take longer than 100 years and up to 1,000 years for plastic to degrade. There are 21.6% of the respondents who realized that plastic will take hundreds of year to degrade. Most of them (60.8%) believed that plastic bags are nondegradable. Fortunately, there are only 17.6% of them who underestimated the potent condition of plastic bags in degradation.

5.2.2.3 As discussed in THE PLASTIC WASTE PROBLEM in chapter 2, burning plastic bags will generate carbon dioxide, chlorofluorocarbon and other toxic gases which are harmful to the environment and human beings. Carbon dioxide was the most recognized gas by the respondents that is produced when

burning plastic bags; accounting for 78.4%, followed by carbon monoxide (42.2%) and chlorofluorocarbons (25.5%).

5.2.2.4 The United States' Environment Protection Agency declared that the main gases in the atmosphere which contribute to the greenhouse effect are carbon dioxide, methane, nitrous oxide, and fluorinated gases. Other gases are sulfur hexafluoride, hydro fluorocarbons, per fluorocarbons and chlorofluorocarbons. Moreover, carbon dioxide, methane, nitrous oxide and fluorinated gases are registered in the Kyoto Protocol as the major greenhouse gases. There are 66.7% of the respondents who recognized that carbon dioxide was one of the greenhouse gases. However, 43.1% of the respondents believed that carbon monoxide was also another gas that counted. In fact, although carbon monoxide harms the human respiratory system, it is not one of the greenhouse gases. Interestingly; only 2% of the respondents recognized methane as the greenhouse gas.

5.2.3 The Behavior of the Students in Using Plastic Bags

5.2.3.1 Estimated Amount of Plastic Bags Used per Day

According to table 11 in chapter 4, the majority of the students (58.8%) used 3 to 5 plastic bags per day. The following tables grouped those students by their monthly income and daily expenses.

Table 24. Estimated Number of Plastic Bags Used per Day Analyzed with Monthly Income*

Monthly Income	Estimated Amount of Plastic Bags Used per Day			
	Less than 3	3-5	More than 5	Total
5,000 or less	9	2	0	11
5,001-10,000	12	15	1	28
10,001-15,000	8	24	5	37
15,001-20,000	4	19	0	23
20,000 or more	2	0	1	3
Total	35(34.3%)	60(58.8%)	7(6.9%)	102(100%)

Table 25 Estimated Number of Plastic Bags Used per Day Analyzed with Daily Expenses*

Daily Expenses	Estimated Amount of Plastic Bags Used per Day			
	Less than 3	3-5	More than 5	Total
100 or less	4	1	0	5
101-200	14	18	2	34
201-300	12	25	4	41
more than 300	5	16	1	22
Total	35(34.3%)	60(58.8%)	7(6.9%)	102(100%)

Note. The underlined numbers shown in table 5.1 and 5.2 refer to the number of the students.

There's no significant relation between the monthly income and the number of the plastic bags used daily, as well as between the daily expenses and number of plastic bags.

5.2.3.2 When buying merchandise, the majority of the students frequently used plastic bags to carry the goods they bought. Most students sometimes brought their own carriers with them when they knew they were going shopping. There are 31.4% of them who rarely or never brought their own carriers. When compared with those who often or always did, those who rarely or never did are about two times larger.

When the sellers were about to put the goods into the plastic bags, and the students saw that it was not necessary because they could carry the goods by means other than using the plastic bags from the sellers; 18.6% always refused to use such plastic bags. However, in the case where the sellers had already put the goods into the plastic bags, the percentage of the students who always rejected to use the plastic bags from the sellers was at 14.7% which was less than the earlier case. Similar results also happened in another comparison of the frequency in behavior of the students. The percentage of students who often refused using the plastic bags when the sellers were going to put the goods into the bags was higher than the percentage of those who often rejected to use the plastic bags when the sellers had already put the goods into the bags. Accordingly, the percentages of the students who sometimes or rarely refused when the merchandise had already been put in the plastic bags were higher than the percentages of those who sometimes or seldom refused when the goods had not been put in.

5.2.3.3 After using plastic bags, 37.3% of the students disposed of the plastic bags while 60.8% of the students kept the plastic bags for reuse later. Twenty-nine point four percent of the students claimed that they always save the plastic bags for reuse when they saw that such plastic bags were reusable and 39.2% frequently did. However; when the students had no desire to use the plastic bags anymore, 82.4% of them places such plastic bags properly in litter bins or at the places arranged for garbage keeping.

5.2.3.4 Forty point two percent of the respondents never littered the plastic bags at any places not arranged for waste keeping and 38.2% of them rarely did so. Only 3% stated that they always or often littered. Significantly; when there appeared to be no garbage bin or such arranged places nearby, 83.3% of the students kept the used plastic bags with them and disposed of the plastic bags properly when they found the litter bin or arranged place.

In other cases; when the students wanted to dispose of the plastic bags in the litter bins or at the places which were arranged for disposal but the first litter bin or place they reached was extremely full, and there was garbage spilling out of it, 72.5% of them headed to another bin or arranged place but 27.5% left the plastic bags there anyway.

When the students found the plastic bags being littered improperly; 53.9% of them took the plastic bags to dispose of properly in litter bins or at places arranged for such disposal if it's not difficult to do so. However; 16.7% claimed that they did the same thing no matter how difficult it was.

5.3 DISCUSSIONS

This section involves discussions on interesting issues drawn from the summary of the findings of this study.

5.3.1 According to the findings, the majority of the students disbelieved that plastic bags were nondegradable. However; to look on the positive side, most students didn't underestimate the potent condition of plastic bags degradation. Most of them thought that plastic bags took hundreds of year to degrade, which is relevant to the report of Envis Centre on Environmental Information System in PLASTIC BAG DEGRADATION, CHAPTER TWO. If that was the case, then they believed that the plastic bags issue was menacing and tended to use fewer plastic bags.

5.3.2 Many students thought carbon monoxide was another gas which contributed to global warming, which was untrue. In fact, there are other types of gases contributing to the greenhouse effect and global warming as stated by the United States' Environment Protection Agency in GREENHOUSE EFFECT AND GLOBAL WARMING, CHAPTER TWO. While methane is indeed a major

greenhouse gas identified by the Kyoto Protocol, few of them recognized it as another cause of global warming.

5.3.3 The findings suggested that; the majority of the students were likely to be aware of the plastic bags issue and tended to reduce the number of the plastic bags they would use by preparing their own carriers, rejecting the plastic bags that seemed unnecessary. However, it can be implied that the sellers' actions influenced student behavior. Some students tended to use the plastic bags unavoidably if the sellers had already put the merchandise in the plastic bags, even though the students saw that the plastic bags given were unnecessary.

5.3.4 Most students took responsibility for disposing of the plastic bags they used properly. Even if there was no litter bin nearby, 83.3% of them kept such bags and dispose of them at the proper places later. And when the first litter bin they reached was full and there was also garbage spilling all over, 72.5% of the students headed for another litter bin. Moreover, most students took the plastic bags to dispose of at the right place if they found such bags being littered improperly. Fifty-three point nine percent of them did so if they found it was not difficult to do and 16.9% did so no matter how difficult it was.

5.4 CONCLUSION

The study can conclude that; the majority of the students were concerned about the plastic bags issue. Although there were some students who misunderstood some facts, most of them were well-informed about the advantages and disadvantages of plastic bags. However, while the majority of them can recognize most of the greenhouse gases, many of them failed to register methane as one of the major gases which contributes to the greenhouse effect. They also thought that carbon monoxide was another greenhouse gas, which is not true. As a result, the students might be unaware and continue performing certain activities which can emit methane. This can lead to more greenhouse gas being emitted to the atmosphere unknowingly.

As for the behavior, the majority of the students tended to reduce the number of the plastic bags they use. However; the sellers' action can influence the students' behavior in using plastic bags. To successfully reduce using plastic bags, the

merchandisers play an important role in influencing the buyers not to use the plastic bags unnecessarily.

It can also be implied from the research that, most students are aware of proper plastic bag disposal. Many of them disposed of plastic bags properly at the places arranged for and did the same for plastic bags which were found being littered improperly.

5.5 RECOMMENDATIONS FOR FURTHER RESEARCH

Based on the findings and conclusions of this study, the following recommendations are made for further research:

5.5.1 The study was limited to 102 students of 3 universities in Bangkok. To obtain more accurate results, which can be generalized to the population at large, the sample size should be expanded to cover more of the population and more areas.

5.5.2 Further study may also focus on other groups of people such as high school students or vocational school students to explore and compare the differences and similarities in behavior of the different groups.