CHAPTER 1

INTRODUCTION

1.1. Background

The term 'environment' originates from the French word 'environner' which means to surround or encircle. Hence, the environment encompasses all the physical, social, economic and political factors that surround and affect an organism or a group of organisms. These components are inter-connected and they interact among themselves and also with other organisms, thus forming a complex system. As a result, it is difficult to remove or change any component without affecting others. John Muir stated it accurately in this quotation; "When we try to pick out anything by itself, we find it hitched to everything else in the universe" (Miller, 1995)

The environment is not static. It changes with time but yet remains in a state of overall equilibrium. Since human beings existed on earth, they have learned to interact and adapt themselves to the environment. However, as civilization sets in, human greed increases, making it difficult to refuse material development which promises better quality of life. In order to maintain a society for a long period, it requires not only a secure and continuing supply of raw materials, human labor and technology used directly in the production process, but also a similar supply of the conditions that make the process possible (Huckle & Sterling, 1996). Thus, developing countries would borrow money, expertise and technology especially from the developed countries to achieve economic

development without further thinking whether the intended development is needed by the local people or the suitability of the technology adapted. Humans exploit the natural resources as if they were inexhaustible and thus leading to various environmental problems such as flashfloods, droughts, pollution, out breaks of common as well as new diseases, erosion of biodiversity and many more.

1.2. Tropical Rainforest and Rainforest Issues

The rainforest of the humid tropics occurs in three large regions: South and Southeast Asia, Equatorial Africa and Central and South America (especially the Amazon Basin). Rainforest also occurs on Madagascar, Mauritius, and various small tropical islands in the Pacific and Indian Oceans and along the coast of Queensland (Australia). Tropical rainforest comprises of tall trees with huge buttress roots for support and a closed canopy overhead. Floristically, the humid tropic is very rich. Of the approximate 250,000 species of flowering plants in the world, about two-thirds are found in the tropics. The breakdown shows over 80,000 in Central America and the tropical part of South America, 40,000 in Asia, 35,000 in tropical Africa and 8,500 in Madagascar. Even excluding Indo-China, Southeast Asia has about 25,000 species (Guptar & Asher, 1998).

The Malaysian rainforest for example, displays a striking and significant rainforest biodiversity. In its prime condition, the Malaysian rainforest is home to more than 15,000 species of vascular plants, 300 mammal species, 700 bird species, 350 reptile species, 300 freshwater fish species, 165 amphibian species

and millions of species of insects and microbes (Ministry of Science, Technology and Environment, 1998). In the plant kingdom, the flora of Malaysia is exceedingly rich and is conservatively estimated to contain about 12,500 species of flowering plants and more than 1,100 species of ferns and fern allies (Ministry of Science, Technology and Environment, 1998). It is no wonder why the Malaysian Forest has been declared as one of the twelve global mega-diversity centers. These resources are important not only for environmental stability but also for food security, cultural heritage, scientific, educational and recreational values.

The loss of huge forest areas, particularly in developing countries have resulted in the extinction of many endemic species, soil erosion, reduction in water supply and climate change. The tropical rainforest for example, is being destroyed and exploited at such an extraordinary rate. In 1989 for example, in a report for Friends of the Earth (UK), Norman Meyers put the annual rate of totally destroyed tropical forest loss at 142,000 km^2 and another 200,000 km^2 as seriously degraded (World Rainforest Movement, 1990). Large areas of Southeast Asia were planted with rubber trees in the twentieth century replacing many lowland rain forests. The recent replacement and extension of oil palm continues to displace the forest.

Sustainable shifting agriculture turns into a forest destruction activity when population pressure builds up. An increase in population density may follow in an increase in the number of people, but more commonly, it starts to happen as

the area under forest is reduced or as the shifting cultivators face more and more restrictions over the area they can shift for agriculture.

At home, our rainforest resources have much been exploited over the years. In Peninsular Malaysia, forest area declined from about 69% of the total land area in 1966 to 55% in 1978 and to 47% of the total land area in 1990 (Sham Sani, 1999). In 2000, the total forested land in Peninsular Malaysia was reduced to 45.43% of the total land area (Forestry Department, 2000). Our forest resources were heavily exploited for tin mining and rubber plantations during the colonial period. After Independence in 1957, in an effort to wipe out poverty and improve social conditions among the major ethnic groups, a land development programme was carried out. In the 29 years since its inception in 1956, the Federal Land Development Agency (FELDA) has developed a total of 660,035 hectares of agricultural land in Peninsular Malaysia (Sham Sani, 1999).

Logging is also an important contributor to deforestation in Malaysia. In 1995, the export of major timber product was RM 2.25 billion (Forestry Department, 2000) and in 2000, the export of major timber products rose to RM 3.66 billion (Forestry Department, 2000). About 80% of the world tropical hardwood exports come from Asia. Very high rates of timber extraction are found in Indonesia, Malaysia and the Philippines (Guptar & Asher, 1998). It is not only the extracted material that depletes the forest but the felling of large trees also destroys the vegetation near them and requires construction of road facilities for easy accessibility and timber collection.

There are many other forms of development that are further pressing on our forest resources. These developments include the building of dams for hydroelectric power and irrigation schemes (e.g. Pergau dam, Temenggor dam, Kenyir dam, Muda dam, etc), road or highway construction (e.g. North-South Highway, East West Highway, Highland Resort Road, etc.) land for housing development, industrialization and urbanization. This leaves us with the Main Range as our largest forested area in Peninsular Malaysia while most lowland forests have been developed in order to meet the needs of the current population.

The causes of deforestation vary in importance from country to country. In Southeast Asia, logging and plantation agriculture destroys rainforest and unsustainable shifting cultivation is the main cause in Central Africa. Settlement and ranching are the major causes of deforestation in South and Central America while firewood collection in drier areas and on the slopes of the tropical mountains is degrading our forest resources. Many of these mishaps happen because most third world countries do not understand, that, to develop a system that is suitable to the local environment, we need to understand our own environment and to learn from our own past and present experiences. We must not be blinded by the advancement and technology owned by other countries. Only then, we can develop suitable and effective solutions to our problems.

1.3. History of Environmental Awareness and Environmental Education

Human attitude towards the environment has not changed significantly throughout their existence. It has remained the same mixture of concern and reckless exploitation with the exception, that, modern man has increased ability to both degrade and manage the environment. Human society created environmental issues and environmental problem but to be able to solve them, a society or some part of it must first recognize it as a problem.

The continuous modification of the earth surface, alteration of the air and water quality puts the entire planet in a critical state. This condition has led to an increased awareness of the deterioration of the environment and the need to nurse the deteriorating earth. There is no single date, which can be attributed to the growth of such awareness in the modern times (Gupta & Asher, 1998). Awareness and concern for the protection of nature was present in the middle of the nineteenth century which arose from two widely different types of background: the growth of natural sciences following Humboldt, Darwin and Wallace and the romanticism and educational value as espoused in the writings of Wordswarth, Emerson and Thoreau (Gupta & Asher, 1998).

The thrust of the environmental movement changed in the early 1960s. The publication of Rachel Carson's "Silent Spring" in 1962 was a benchmark in the history of the environmental movement. In her book, she puts forward strongly the disastrous consequences of using dangerous pesticides, including DDT, indiscriminately. "Silent Spring" was widely read and it made a powerful impact on the affluent educated white Americans. They could identify the situations put

forward in "Silent Spring' with their daily lives, particularly the effects of uncontrolled use of dangerous pesticides in agriculture.

The 1950s and 1960s were also times when unhappiness and worries about the state of the environment remained in the forefront following a number of atomic tests carried out by the USA, the USSR, Britain and France, with accompanying instances of radioactive contamination of land, water and people. A series of environmental disasters in the 1960s further exposed the increasingly mismanaged state of the world's environment. These included the repeated pollution of extensive coastal waters from large scale oil discharged from the tanker *Torrey Canyon* off the southwest coast of England, the mining spoil heap landslide at Aberfan, Wales or the discharge of effluents containing mercury in the waters of Minamata Bay, Japan. People started to realize that environment degradation was affecting their everyday lives and they have lost control of the environment.

With all this mishappenings, environmental education made its first appearance on the formal education scene in the late 1960's. The search for the definition of environmental education has been dynamic and progressive. There are many definitions of environmental education put forward by various people. Some think that environmental education is a part of conservation science or a new version of science education while there are some who think that it is an enlargement of biology into ecology or a modification of geography into something broader and deeper (Arnstein, 1971). All these can be accepted when defining environmental education. Stapp et. al. (1969) stated that

"Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems and motivated to work towards their solution."

(cited in Gigliotti, 1990; page 1)

Despite its early appearance, environmental education was only taken seriously in 1972 during the United Nations Conference on the Human Environment in Stockholm. The Stockholm Conference of 5-16 June 1972 is a benchmark event for various reasons. It helped the environmental movement to develop into a global movement; it altered the thrust of the environmental concern; it correlated good environment with development; and it admitted that both officials and citizens should share the concern and responsibility. The conference brought in representatives from 113 countries. It was attended by a number of international organizations and for the first time, Non-Governmental Organizations (NGOs) were officially involved. A number of principles and action plans came out of the Stockholm Conference. In summary, the principles were as follows:

- Protection and conservation of natural resources
- An inter-relationship of development and environmental concerns
- The establishment of environmental standards and resource management at a country scale without endangering other nations
- Limited pollution

- Use of science, technology, education and research in the field of environmental concern

(UNESCO, 1980)

During the conference, an action plan was defined and produced that aimed to improve environmental quality through education programme. One of its recommendations was for

"the organization of the United Nations system, especially the United Nations Educational, Scientific and Cultural Organization and, the other international agencies concerned, should after consultation and agreement, take the necessary steps to establish an international program, in environmental education, interdisciplinary in approach, in school and out of school, encompassing all levels of education and directed towards the general public, in particular the ordinary citizen living in rural and urban areas, youth and adult alike, with a view of educating him as to the simple steps he might take, within his means, to manage and control his environment."

(UNESCO, 1980; page 7)

Since 1975, UNESCO and UNEP have been jointly implementing international environmental education programme, which began with the launching of the International Environmental Education Programme at Belgrade in 1975. The Belgrade Charter aimed to develop an environmental education philosophy, objectives, goals, contents, teaching methods and evaluative techniques and strategies for their incorporation into educational policies and

plans at all levels. The Belgrade Charter documented several important environmental education aims:

a) to enable human to understand the complex relationship in the environment as a result of the interaction between human and nature and between people

b) to develop a national awareness of the importance of environment in development so that humans may form actions that are used in harmony with nature

c) to develop people that are aware and concerned about the environment and its associated problems which develop responsible and committed individuals

(UNESCO, 1977)

Following the Belgrade Charter, there were several other meetings held in 1976 and 1977, which laid down the concepts relating to environmental education. In October 1977, the Tbilisi Intergovernmental Conference was held and it defined environmental education as:

"*.... a process of developing a world population that is aware of and concerned about the total environment and its associated problems and which has the knowledge, skills, attitude, motivation and commitment to work individually and collectively towards solutions of current problems and prevention of new ones.*"

(UNESCO, 1980; page 9)

The Tbilisi Conference outlined 41 recommendations on various environmental issues, which discussed environmental problems in the society and the role of environmental education in facing these challenges, the development of environmental education at all levels and strategies for the development of

environmental education. Thus, this was an important event in the history of environmental education because it laid the foundation for an environmental education programme at the national and international levels.

The development of International Environmental Education Programme was further enhanced with the second meet at Moscow in 1987. The UNESCO-UNEP International Congress on Environment Education and Training produced an International Strategy for Action in the Field of Environmental Education and Training for the 1990s to improve on the existing environmental education action plan. The conference emphasized on science and technology in environmental education for 1990s' and the 21st century.

In June 1992, the United Nations Conference on Environment and Development (Earth Summit) was held in Rio de Janeiro. The UNCED was successful at raising awareness on various pressing problems of today which contributed to the complex interactions of environment and development. The conference produced 5 formal documents with Agenda 21 as the most substantial product of UNCED. Agenda 21, signed by 178 heads of states at Rio Earth Summit in 1992 is the international consensus on the interlocking issues facing humanity and the steps that must be taken by the global community to achieve a sustainable future. In particular, Agenda 21 sought the integration of development needs with those of ecologically sustainable management of the environment. The agenda reflected a global consensus and political commitment at the highest level on development and environment cooperation with emphasis on the responsibility

of the government for its implementation. Chapter 36 of the Agenda 21 document discusses about environmental education with emphasis on

a) reorienting education towards sustainable development

b) increasing public awareness

c) promoting training

Many people seem to be little concerned with environmental problems and do not know how to protect the environment simply because they had no chance to learn about the environment during their school or college days (Tatuo Kira, 1999). McInnis (1972) states "environmental education is the process of recognizing and clarifying the values, attitudes and concepts necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical environment. Environmental education is also the development of personal awareness, understanding and action in relation to the experience and change of nature as well as the nature of experience and the nature of change." In order to achieve these, it is a life-long learning process. Environmental Education opens a window to the world of discovery as we continue to learn more about global change by recognizing human impacts on the physical surroundings and the responsibilities we must accept in order to achieve sustainable development. All these would enable us to make ecologically sound judgements and act accordingly.

1.4. Trends of Environmental Education in Malaysia

Before the 1980s, non-formal environmental education programme such as the formation of Nature Clubs, Geography Societies, Maths and Science Societies, Uniform Bodies etc. formed the foundation of environmental education. The NGOs such as the World Wildlife Fund for Nature (WWF), Malaysian Nature Society (MNS), Penang Consumers Association (CAP) and Sahabat Alam Malaysia (SAM) play an important role in creating environmental awareness through talks, exhibitions, nature studies and camps for students and public.

In the 1980s, environmental concepts were formally introduced into the Malaysian Education system. The subject "Man and the Environment" was introduced at the primary level in 1982 under the Integrated Primary School Curriculum (KBSR). Now, the subject "Man and the Environment" has been replaced by Local Studies and General Science at primary level to introduce the basic elements of the natural ecosystems. At the secondary level, environmental education is infused into all subjects particularly in Biology, General Science, Geography, Local Studies, Islamic and Moral Studies. In 2003, the Science subject was introduced at Primary One level to steer early interest in science and the environment. Schools were also encouraged to promote environmental awareness during the teaching and learning process as well as through the co-curriculum activities. However, bulk of the environmental education components are usually promoted in co-curriculum activities such as recycling projects, creation of gardens in schools, talks on environment, cleaning-up campaigns and many more which are compulsory in all schools, both at primary and secondary

levels. Hence, there is no specific subject on environmental education but environmental associated issues are integrated into the curriculum as cross-curriculum issues. Through the infusion of environmental related issues in all subjects, it is hoped that students can achieve a better understanding of the inter-relationship and inter-connectedness of the environment as well as providing a more holistic approach on the study of environmental matters.

In Malaysia, environmental education is defined as

"...an educational process about, for and through the environment to upgrade the living standards of the people."

(Mustapah, 1999; page 2)

It aims at improving the quality of life of people and the quality of the environment with importance placed on sustainable development through an understanding and wise management of all natural resources (Mustapah, 1999). Various methods and approaches are adopted by various governmental and non-governmental organizations to create environmental awareness among school children. Among the programmes and projects was the Environmental Education Programme in Schools organized in the late 1980's. The Environmental Education Programme consists of:

a) **Environmental Education Curriculum** which aims to develop students to be more sensitive and observant about environmental issues and enable them to acquire knowledge, skills, values and commitment so that they can act individually or collectively to solve environmental issues and sustainable development issues.

b) **Strategies and Methods of Training and Learning** through the spiritual and moral, infusion, student-centered and inquiring approaches.

c) **Learning Stations on Environmental Education** by utilizing school compound and its surrounding for teaching basic environmental concepts through the environment or simulations.

d) **Environmental Education Materials** which have been published to assist teachers in teaching environmental education in schools such as "Teacher's Guidebooks on the Infusion of Environmental Education Across the Primary School Curriculum and the Secondary School Curriculum", sample teaching and learning modules. Due to limited production of environmental education materials by the Ministry of Education, schools were encouraged to produce their own teaching and learning modules and to set up education resource centers in addition to those produced by other governmental organizations such as the Department of Wildlife and Nature Parks, Forestry Department, Department of Tourism, and NGOs.

e) **Evaluation** on the effectiveness of teaching and learning of environmental education by using 5 behavioral aspects, namely, knowledge and understanding, values and attitudes, thinking skills, manipulative skills and the use of senses and application of what has been learnt.

f) **Training of teachers** so that they can then conduct in-house training and setup exemplary environmental education centers in their own schools. In 1997, the environmental education course was introduced into the formal curriculum of all teacher-training colleges in the country to enhance environmental

understanding and awareness of environmental related issues. The trained teachers are well equipped with knowledge and skills to assist them in infusing environmental education across the curriculum.

g) **Monitoring** to ensure the success and effectiveness of the environmental education programme in schools through close monitoring, school visits and reports of the status of the environmental education programme in schools.

(Mustapah, 1999)

In the Seventh Malaysian Plan (1996-2000), the government placed emphasis on environmental education for sustainable development to ensure the environmental quality is protected. The Government will strive to encourage sustainable development in every development plan or programme of the public sector to ensure environmental matters are taken into consideration when economic decisions are made.

In 1998, the Ministry of Education formulated a programme on environmental education called the "Environmental Education Across Curriculum". The programme defined six basic needs of environmental education:

a) Gain experience, knowledge and basic understanding about the environment and its problems
b) Be sensitive, aware, and caring about the environment and problems related to it
c) Have a positive attitude, value and love the environment and be motivated to be actively involved in the preservation and conservation of the environment

d) Understand that national development should only be undertaken with careful planning

e) Acquire skills needed to identify and solve environmental problems

f) Be given the opportunity to be actively involved in solving environmental problems

(Ministry of Education, 1999)

The environmental education across curriculum KBSM is divided into 6 major topics and they are:

a) God the Creator of the Universe and All Living Things

b) The Earth and the Universe

c) Non-living Things and the Natural Resources

d) Living Things and the Environment

e) Interaction between Humans, Animals and Plants

f) Environmental Management

(Ministry of Education, 1999)

To conduct this programme, the Ministry of Education has prepared education materials for students and in-service teachers are given training courses. The curriculum is constantly being upgraded in ensuring that more environment elements are infused into the curriculum. This programme was formulated as Malaysia sees the importance of preserving and conserving our environment as other countries especially the developed countries are losing much of their natural heritage.

In November 2002, the Ministry of Science, Technology and Environment launched the 'National Policy on the Environment'. The policy aims at continued economic, social and cultural progress of Malaysia and enhancement of the quality of life of its people, through environmentally sound and sustainable development. The policy is based on 8 principles with a broad-based strategic approach to promote environmental soundness through research and development, economic efficiency, social equity, responsibility and accountability. The policy aims at developing a broad foundation to support its implementation and further development, involving all sectors of society, including government, business and industry, academia, non-governmental organizations, the community and the family.

Malaysia's Green Strategies will be directed towards 7 key areas including 'Education and Awareness'. The 'Education and Awareness' strategy aims to achieve a deeper and better understanding of the concepts of environmentally sound and sustainable development, and a caring attitude towards nature. Environmental education and awareness will be promoted across the board incorporating information, dissemination and training, in line with the recommendations of Agenda 21. In detail, it declares that

i. Comprehensive formal and informal environmental education and training strategies and information dissemination programmes will be devised and introduced.

ii. Environment and development will be integrated into educational activities, from school to tertiary institutions. Towards this end,

relevant methods and materials will be developed for environmental education programmes.

iii. National centers of excellence will be established for interdisciplinary research and education in environment and development, towards a view to strengthening national capacity in related fields.

iv. Education curricula at all levels will be reviewed to ensure a multidisciplinary approach with environment and development issues.

v. Non-formal education activities will be promoted at local and national levels. These activities will include the direct involvement of social support groups and recognize the important role of the family unit in inculcating positive environmental attitude.

vi. Public information services on environment and development will be made available and these may include information technology, multi-media and other audio-visual methods. Public and academic forums to discuss environmental and development issues will be encouraged.

vii. Activities in the arts and culture circles which contain a positive message with regard to the environment and development will be promoted.

viii. The role of the media in disseminating environmental information will be strengthened. In particular, environmental journalism and

associations of environmental journalists will be accorded recognition, with a view to raising the quality of environmental reporting.

ix. Cooperative relationships with the media, entertainment and advertising industries will be promoted to mobilize their experience in shaping public behavior and consumption patterns

x. Environment and development issues will be integrated into activities of groups including professional associations, trade unions and employers' organizations. Dissemination of information and training will be extended to include decision makers, employees and employers.

xi. Manpower training programmes will be designed to enable trainees to deal with environment and development problems.

(Ministry of Science, Technology and Environment, 2002)

1.5. Objectives of the Study

The objectives of the study are

a) to examine the level of environmental awareness, knowledge and attitude of secondary school students in Melaka towards tropical rainforest issues

b) to examine students' reading or watching environmental programme habit and students' involvement in environmental activities

c) to determine if there are significant differences in students' environmental awareness, knowledge and attitude towards tropical rainforest issues, students'

reading or watching environmental programme habit and students' involvement in environmental activities with locations of schools (urban and rural), forms (form 1 and form 4) and gender (female and male)

The study expects urban school and Form 4 students to have higher level of awareness, knowledge and attitude towards tropical rainforest issues compared to rural school and Form 1 students. Similarly, urban school students and Form 4 students are also expected to read or watch environmental programmes and participate in environmental activities 'frequently' or 'often' compared to rural school students and Form 1 students. Between gender, female students are expected to show higher level of environmental awareness, knowledge and attitude towards tropical rainforest issues compared to male students.

1.6. Research Questions

a) What is the level of environmental awareness, knowledge and attitude of secondary school students in Melaka with regards to tropical rainforest issues?

b) What are students' reading or watching environmental programme habit and students' involvement in environmental activities?

c) Are there any significant differences in students' environmental awareness, knowledge and attitude towards tropical rainforest issues, students' reading or watching environmental programme habit and students' involvement in

environmental activities with locations of schools (urban and rural), forms (form 1 and form 4) and gender (female and male)?

1.7. Significance of the Study

The study will establish the level of environmental awareness, knowledge and attitudes of Melaka secondary school students towards tropical rainforest issues. The study also determines the extend of students' reading or watching environmental programme habit and students' involvement in environmental activities The independent variables involved are gender, form level and locality of school. The study is important as,

a) the findings are important to evaluate the general level of Melaka students' environmental awareness, knowledge and attitude towards tropical rainforest issues. The findings will assist the policy-makers, educators, planners and implementers in gauging the effectiveness of our current environmental related syllabus and education system. Then, effective strategies can be sorted out for effective dissemination of information through the school curricular and co-curricular activities

b) the findings will determine whether there is a need for more and in depth information on tropical rainforest issues to be published and distributed widely, which should not be confined to students only but also for the general public. It is also important that these published information are clear and made easy to understand

c) the findings will add weight to the importance of reviewing and strengthening the Environmental Education Policy and the introduction of environmental education as a subject in school. They are important if we want our education system to be effective in instilling appreciation of nature and to generate students who are environmental friendly and capable of making decisions on sustainable management

1.8. Definition of Terms

- *Environmental Awareness* refers to the sensitivity of individuals to the total environment and it's allied problems (Mustapah, 1999). It simply means to be aware of what is wrong with our environment and to be aware of a way to make the wrong right (Benjamin, 1971). It deals with our quality of life be it our individual homes, our community and the earth. It is through environmental awareness that we are able to make right and just decisions.

- *Environmental Knowledge* is information on the environment gained from a variety of experiences leading to a basic understanding of its associated problems. Gambro and Switzky (1996) defined it as student's ability to understand and evaluate the impact of society on the ecosystem. This knowledge is demonstrated by reorganizing environmental problems as well as comprehending the origins, implications and consequences of those problems.

- *Environmental Attitude:* It comprises the set of values and feelings of concern for the environment and motivation for actively participating in environmental

improvement and protection. Attitude is primarily characterized by evaluative human responses but these expressions may or may not be accompanied by the associated action beyond the verbal level (Knapp, 1972).

- *Tropical Rainforest* : Miller (2001) describes the tropical rainforest as a type of broadleaf evergreen forest found near the equator. These forests have warm annual mean temperature, high humudity and heavy rainfall almost daily. In general, the tropical rainforest forest occurs where the annual rainfall is greater than 2,500 mm, where forest grow mostly at low elevations, have a complex structure and are rich in both plants and animals. Soils tend to be shallow and poor in nutrients, features having a marked effect on forest management practices.

- *Tropical Rainforest Issues*: Tropical rainforest issues refers to basic information about the tropical rainforest such as the location and characteristics of tropical rainforest, its plants and wildlife, the importance of tropical rainforest, causes of deforestation, the effects and mitigation actions, the impact of global warming on rainforest, forestry laws and policies, the agencies involved and their contributions.

- *Secondary School Students* : In this study, the secondary school students refers to students in form one and form four in urban and rural schools in 2001.

- *Location of school:* Urban schools refer to schools located in Melaka Tengah while schools in Jasin were considered as rural.

1.9. Limitations of Study

- The results of the study can be used as a baseline data but it does not represent the environmental awareness, knowledge and attitude of the entire student population in Melaka. This is because the number of secondary school students sampled was not large and was only represented by 255 students from Melaka Tengah and Jasin.

- The study assessed only five independent variables, namely, students' gender, forms, locations of schools, students' reading or watching environmental programme habit and involvement in environmental-related activities. Other possible influencing factors such as family income, religion, peer interactions, etc. were not considered in this study because the five factors assessed in the study were seen as the most important factors in determining students awareness, knowledge and attitude towards tropical rainforest issues. Factors such as family income are often associated with location of school where most white-collar jobs are concentrated in the urban district while blue-collar jobs are usually found in the rural district. Besides that, family income is usually a personal matter and a survey on it may not have obtained reliable data. Similarly, peer interactions are often associated with level of education.