



UNIVERSITI PUTRA MALAYSIA

**ENVIRONMENTAL SETTINGS OF THREE
RECREATION FORESTS AND THEIR EFFECTS ON
VISITORS' PERCEPTION**

NOORAZLIN YAHYA

FH 1999 7

**ENVIRONMENTAL SETTINGS OF THREE
RECREATION FORESTS AND THEIR EFFECTS ON
VISITORS' PERCEPTION**

By

NOOR AZLIN YAHYA

**Dissertation Submitted in Fulfilment of the
Requirements for the Degree of Doctor of Philosophy
at the Faculty of Forestry,
Universiti Putra Malaysia**

March 1999



ACKNOWLEDGEMENTS

I would like to extend my heartfelt gratitude to my main supervisor, Dr Wan Sabri Wan Mansor, for having confidence in me, for guiding me throughout the toughest time and for inspiring diligence in me. My gratitude to my other supervisors, Associate Prof Dr Kamaruzaman Jusoff who was always ready to advise and Dr Zahid Emby whose advice is much appreciated.

I am indebted to the Forest Research Institute Malaysia (FRIM), for the time allowed and for financial support to see the project through. My gratitude to the Director General of FRIM, Dato' Dr Abdul Razak Ali and the former Director General, Dato' Dr Salleh Mohd. Nor. They both gave me the greatest encouragement and confidence throughout the study. Thanks are also due to Dr Baskaran, my Division Director and Dr. Manokaran, my former Director.

I would like to acknowledge the assistance of the various staff involved throughout this study. Azahari, Harun, Khairullah, Mahat, Low Poh, Juraina, Zawiah, Zuraida, Ridhuan and Rabiaturun. My special thanks to Patrick, who unselfishly shared his knowledge and experience with me, especially on vegetation. And to others in FRIM who contributed in guidance and spirit, Ho, Norwati, Rasip, Hayati, Azman, Elizabeth, Adnan, Azaruddin, Faridah, Bernd, Graham and many others. I thank all of you and I thank Allah for allowing your paths to cross mine.



My appreciation to my beloved husband, Bhakhari, for the support, understanding and sacrifices shown throughout this period. My sons, Shafiq and Amir, both conceived near this study period were my inspiration. I apologise for the time taken away from all of you, but you are always in my heart. To my families in Ipoh and Terengganu, I would like to thank you for your support.

I dedicate this dissertation to my father, Yahya Din, who developed in me values and confidence which take me to my accomplishments today. His gift of Encyclopedia sets when I was eight is the most memorable gift of all. The wonderful lessons and stories had given me endless hours of joy and foremost, had instilled in me the love to read. I always believe those were the most valuable gifts anyone could receive. For everything that you give, I thank you father. I hope you will continue to include me in your prayers. Alhamdulillah.



TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	ii
LIST OF TABLES.....	ix
LIST OF FIGURES.....	xiii
ABSTRACT.....	xvii
ABSTRAK.....	xx
CHAPTER	
I INTRODUCTION.....	1
Background.....	1
Problem Statement.....	4
Theoretical Framework.....	7
Objectives of the Study.....	11
Significance of the Study.....	12
Limitations of Research.....	14
Contents of Chapters.....	15
II LITERATURE REVIEW.....	16
Background.....	16
Conservation and Ecotourism.....	17
Malaysian Forests as Recreational Settings.....	19
Recreation Forests.....	21
Recreational Impacts.....	23
Assessing Visitors' Perceptions of Recreational Impacts.....	28
Visitors' Perceptions.....	32
Crowding.....	33
Satisfaction.....	35
Physical Impacts.....	38
Vegetation.....	39



	Soil.....	40
	Water.....	42
	Wildlife.....	43
	Application of Impacts Studies in Recreation Management.....	45
	Limits of Acceptable Change (LAC) Concept.....	46
	Determining Acceptable Conditions.....	49
	The Need to Understand Recreational Impacts in Malaysian Recreation Forests.....	53
III	METHODOLOGY.....	55
	Framework of Study.....	55
	Selection of Study Area.....	57
	Data Collection.....	60
	Visitors' Perceptions: A Questionnaire Survey.....	60
	Natural Resource Conditions.....	69
	Data Analysis.....	75
	Questionnaire Survey.....	75
	Crowding.....	76
	Natural Resource Conditions.....	76
	Prescription of Environmental Indicators.....	77
IV	VISITORS PROFILE AND GENERAL DESCRIPTION.....	78
	Profile of the Respondents.....	78
	Opportunities which Motivate Visit to Recreation Forests.....	81
	Activities Undertaken During Visit.....	85
	Perceptions on Environment of the Recreation Forest in General.....	86
	Discussion.....	88
V	VISIT DENSITY AND DISTRIBUTION PATTERNS IN RECREATION FORESTS.....	90
	Spatial Density in Recreation Forests.....	91
	Temporal Density in Recreation Forests.....	94
	Discussion.....	94



VI	NATURAL RESOURCE CONDITIONS OF RECREATION FORESTS....	96
	Vegetation.....	96
	Ground Vegetation and Seedling Regeneration.....	96
	Tree Vandalism.....	98
	Soil.....	102
	Soil Compaction.....	102
	Bulk Density.....	106
	Water Conditions.....	108
	Discussion.....	110
VII	VISITORS' PREFERENCES FOR FOREST RECREATION ENVIRONMENT.....	112
	Important Features for Recreation Environment.....	112
	Polluting Features of Recreation Environment.....	116
	Preferences for Crowding Conditions.....	120
	Crowd Conditions for Comfort and Socio-economic Variables.....	121
	Crowd Conditions and Activities Undertaken.....	122
	Crowd Conditions and Number of Person in Group.....	123
	Willingness to Spend for Clean Environment and Solitude.....	125
	Willingness to Spend by Different Recreation Forests.....	125
	Willingness to Spend by Socio-economic Variables.....	131
	Willingness to Spend by Activities.....	140
	Discussion.....	145
VIII	VISITORS' PERCEPTIONS OF ENVIRONMENTAL CONDITIONS IN RECREATION FORESTS.....	150
	Perceptions on Crowd Conditions	150
	Perceptions of Crowd as a Problem.....	153
	Differences of Crowd Perceptions against Actual Conditions.....	155
	Motivation and Crowd Perceptions.....	158
	Activities and Crowd Perceptions.....	161
	Perceptions on Natural Resource Conditions.....	161



	Perceptions on Specific Reasons for Unsatisfactory Vegetation Conditions.....	164
	Perceptions on the Ideal Vegetation Conditions.....	166
	Motivation and Vegetation.....	167
	Perceptions on Soil Conditions.....	170
	Perceptions on Reason for Unsatisfactory Soil Conditions.....	171
	Perceptions on Water Conditions.....	172
	Perceptions on Reasons for Unsatisfactory Water Conditions.....	175
	Water and Motivation.....	175
	Discussion.....	177
IX	VISIT SATISFACTION FROM FOREST RECREATION EXPERIENCE..	181
	General Satisfaction from Visit.....	182
	Satisfaction Relationship to Socio-economic Variables.....	183
	Satisfaction and Ethnic Groups.....	186
	Satisfaction and Motivation.....	187
	Satisfaction and Activities.....	188
	Satisfaction and Actual Environmental Conditions.....	191
	Satisfaction and Environmental Factors.....	196
	Perceptions of Existing Environmental Conditions and Satisfaction.....	197
	Satisfaction and Activities.....	199
	Satisfaction and Socio-economic Variables.....	201
	Satisfaction and Previous Visits.....	203
	Discussion.....	209
X	SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	214
	Summary.....	214
	Solitude and Crowd Conditions.....	216
	Natural Resource Conditions.....	221
	Conclusion.....	225



Recommendations.....	226
Zoning by Activities.....	226
Lessening Impact of Recreational Use on Natural Resources.....	227
Implications for Further Research.....	228
 BIBLIOGRAPHY.....	 231
 APPENDIX	
A: Locations Of Study Sites.....	240
B: Questionnaire.....	244
C: Additional Tables.....	260
 VITAE.....	 269



LIST OF TABLES

		Page
1	Factors and Items Considered as Indicators for Acceptable Conditions in Wilderness Areas	53
2	Sampling Sites for the Main Components of the Study.....	59
3	Profile of the Respondents.....	78
4	Visit Characteristics.....	80
5	Opportunities which Motivate Visits to Recreation Forests	82
6	Rankings of Attractions Perceived to be Important in Motivating Visits to Recreation Forests.....	84
7	Activities Undertaken During Visit - Respondents Percentages and Rankings.....	85
8	General Perceptions of Recreation Forest Conditions - Rankings of Frequency.....	86
9	General Problems in Recreation Forests - Rankings of Frequency.....	87
10	Duncan's Test for Significant Difference Between Day Types.....	90
11	Ratio of Visitors Entry by Day Types.....	91
12	Daily Means of Visits Entry and Temporal Density at Sampling Sites by Day Types.....	92
13	Rankings of Crowd Conditions for Recreation Forest Areas and Sites During Sundays/Public Holidays.....	93
14	A Summary for Plant Regeneration at Recreation Forests.....	97
15	Rankings of Plant Conditions (Coverage) Within Recreation Forests.....	98
16	Ranking of Plant Conditions for Different Recreation Forests.....	98
17	Ranking of Tree Vandalism	102
18	Differences in Soil Compaction between Sites.....	105
19	Ranking of Soil Compaction between Sites.....	106
20	Analysis of Variance of Bulk Density between Sites in Recreation Forests.....	107



21	Water Conditions in Recreation Forests.....	109
22	Sites' Ranking of Water Turbidity.....	109
23	Correlation Analysis of Important Environmental Features by Socio-economic Variables.....	115
24	Important Features of Significant Relationship to Socio-economic Variables.....	116
25	Correlations of Crowd Tolerance to Different Groups.....	124
26	Willingness to Spend and Socio-economic Variables.....	139
27	Correlations of Perceived Crowd Conditions to Actual Conditions.....	150
28	Correlations of Crowd as a Problem to Actual Crowd Conditions.....	153
29	Significance of Crowd/Solitude Motivation to Perceptions of Conditions.....	159
30	Visitors' Perceptions of Vegetation Conditions Against Actual Conditions.....	162
31	Relationship between Satisfaction of Vegetation Conditions and Actual Conditions.....	163
32	Relationship between Perceived Vegetation Conditions and Actual Conditions.....	164
33	Visitors' Awareness on Replaced Plant Species against Actual Conditions of Plant Species Composition.....	165
34	Relationship between Perceived Species Replacement and Actual Conditions of Species Composition.....	165
35	Visitors' Perceptions of the Ideal Vegetation Conditions in Different Recreation Forests.....	166
36	Significant Variables of Greenery/Shade Motivation to Perceptions of Vegetation Conditions.....	168
37	Visitors' Perceptions of Soil Conditions against Actual Soil Conditions for Different Recreation Forests.....	170
38	Correlations on Soil Conditions within Recreation Forests.....	171
39	Perceptions on Water Cleanliness against Actual Conditions for each Recreation Forest.....	172



40	Visitors' Satisfaction of Water Conditions against Actual Conditions for Different Recreation Forests.....	173
41	Perceptions of Water Cleanliness and Satisfaction of Water against Actual Conditions.....	174
42	Correlations on Water Conditions.....	174
43	Correlation Coefficients of Water Related Motivation against Perceptions of Water Conditions.....	176
44	Correlations of General Satisfaction for Different Recreation Forest with Different Socio-economic Variables.....	183
45	Correlations of General Satisfaction with Different Motivations.....	187
46	Correlations of Visit Satisfaction to Natural Conditions.....	193
47	Correlations of Site Crowd Level to Visit Satisfaction.....	194
48	Correlations of Satisfaction to Perceptions of Crowd Conditions.....	198
49	Correlations of Satisfaction to Perceptions of Natural Resource Conditions.....	199
50	Relationship of General Environmental Conditions to Satisfaction by Socio-economic Groups.....	202
51	Relationship of Natural Resource Conditions to Satisfaction by Different Socio-economic Groups.....	202
52	Cross-tabulation of When First Visit was Made for Different Recreation Forests.....	203
53	Correlations of Visit Satisfaction to Previous Experience.....	205
54	Correlations of Environmental Changes Perceptions to Visit Satisfaction...	209



APPENDIX C - Additional Tables

1	Reliability Coefficient of the Scales.....	261
2	Plant Regeneration in Recreation Forests.....	261
3	Paired Bulk Density and Total Porosity.....	263
4	Cross-tabulation of Satisfaction to Undertaken Activities.....	263
5	Environmental Condition Effect on Satisfaction by Socio-economic Groups.....	264
6	Cross-tabulation of Satisfaction to Undertaken Activities.....	268



LIST OF FIGURES

	Page
1 Theoretical Framework.....	8
2 Vandalised Tree in Sungai Tua Recreation Forest.....	13
3 Framework of Study.....	56
4 Location Map of Study Areas.....	58
5 Attractions Quoted as “The Most Attractive Opportunities” by Percentage of Respondents.....	83
6 Attractions Quoted as “The Least Attractive Opportunity” by Percentage of Respondents.....	83
7 Means of Visits Entry into Recreation Forest by Day Types.....	91
8 Temporal Distribution of Entrance into Recreation Forests.....	94
9 New Vandalism Marks on Selected Trees at Different Sites in Three Recreation Forests.....	99
10 Types of Vandalism Marks and their Proportions in Each Recreation Forest.....	100
11 Total Vandalism Counts in Each Site of Recreation Forests.....	101
12 Soil Compaction Trends for Different Sites of the Recreation Forests.	103
13 Box Plots of Soil Compaction Levels Between Sites of Three Recreation Forests.....	104
14 Soil Compaction Means for Three Recreation Forests.....	105
15 Bulk Density Level Between Sites of Three Recreation Forests.....	107
16 Important Environmental Features in Different Recreation Forests.....	112
17 Important Environmental Features for Forest Recreation by Age Groups.....	113
18 Important Environmental Features for Forest Recreation by Education Levels.....	114

19	Important Environmental Features for Forest Recreation by Income Groups.....	114
20	Polluting Environmental Features in Different Recreation Forests.....	117
21	Polluting Environmental Features by Age Groups.....	117
22	Polluting Environmental Features by Education Levels.....	118
23	Polluting Environmental Features by Income Groups.....	119
24	Crowd Conditions for Comfortable Environment for Different Recreation Forests.....	120
25	Crowd Conditions for Comfortable Environment by Age Groups.....	121
26	Crowd Conditions for Comfortable Environment by Education Levels...	121
27	Crowd Conditions for Comfortable Environment by Income Groups.....	122
28	Crowd Conditions by Activities Undertaken.....	123
29	Crowd Tolerance by Number of Persons in Group.....	124
30	Willingness to Pay for a Clean Environment in Recreation Forests.....	126
31	Willingness to Walk for a Clean Environment in Recreation Forests....	127
32	Willingness to Pay for Solitude in Recreation Forests.....	128
33	Willingness to Walk for Solitude in Recreation Forests.....	129
34	Willingness to Pay for Clean Environment by Age Groups.....	132
35	Willingness to Walk for Clean Environment by Age Groups.....	132
36	Willingness to Pay for Solitude by Age Groups.....	133
37	Willingness to Walk for Solitude by Age Groups.....	133
38	Willingness to Pay for Clean Environment by Income Groups.....	134
39	Willingness to Walk for Clean Environment by Income Groups.....	134
40	Willingness to Pay for Solitude by Income Groups.....	135
41	Willingness to Walk for Solitude by Income Groups.....	135



42	Willingness to Pay for Clean Environment by Education Levels.....	136
43	Willingness to Walk for Clean Environment by Education Levels.....	136
44	Willingness to Pay for Solitude by Education Levels.....	137
45	Willingness to Walk for Solitude by Education Levels.....	137
46	Activities and Willingness to Pay for Clean Environment.....	140
47	Activities and Willingness to Walk for Clean Environment.....	140
48	Activities and Willingness to Pay for Solitude.....	141
49	Activities and Willingness to Walk for Solitude.....	141
50	Willingness to Spend by Activities for All Recreation Forests.....	142
51	Willingness to Pay for Clean Environment by Activities for Different Recreation Forests.....	143
52	Willingness to Walk for Clean Environment by Activities for Different Recreation Forests.....	143
53	Willingness to Pay for Solitude by Activities for Different Recreation Forests.....	144
54	Willingness to Walk for Solitude by Activities for Different Recreation Forests.....	144
55	Visitors' Perceptions and Total Entrance Count.....	152
56	Visitors' Perceptions Compared to Total Site Count.....	153
57	Perceptions on Crowd as a Problem.....	154
58	Perceived Categories of Seen Human Crowd against Actual Crowd at the Site.....	156
59	Perceived Categories of Expected Crowd against the Actual Crowd at the Site.....	157
60	Perceived Categories of Seen Human Crowd against Expected Crowd Level.....	158
61	Bar Chart of Activities and Crowd Perceptions.....	161



62	Visitors' Perceptions on Reason of Unsatisfactory Vegetation Conditions Compared to Actual Conditions.....	167
63	Perceptions on Reason for Unsatisfactory Soil Conditions.....	171
64	Visitors' Perceptions of Reasons for Unsatisfactory Water Conditions...	175
65	Descriptive Charts of Visit Satisfaction for Different Recreation Forests..	182
66	Satisfaction by Age Groups for Different Recreation Forests.....	185
67	Visit Satisfaction by Ethnic Background.....	186
68	Visit Satisfaction and Activities.....	189
69	Satisfaction Agreement by Different Day Types.....	190
70	Satisfaction of Visit by Different Environmental Conditions.....	192
71	Satisfaction Agreement by Crowd Level.....	195
72	Satisfaction of Visit by Undertaken Activities.....	200
73	Bar Charts of Visit Satisfaction to Compare Respondents with Previous Visit.....	204
74	Perceptions of Environmental Changes from Previous Visit by Environmental Factors.....	207
75	Summarised Perceptions of Environmental Changes from Previous Visit by Different Recreation Forests.....	208
76	Visit Satisfaction by Perceived Environmental Changes from Previous Visit.....	208



**Abstract of dissertation submitted to the Senate of Universiti Putra Malaysia
in fulfillment of the requirements for the degree of Doctor of Philosophy.**

**ENVIRONMENTAL SETTINGS OF THREE RECREATION FORESTS AND THEIR
EFFECTS ON VISITORS' PERCEPTION**

By

NOOR AZLIN YAHYA

March 1999

Chairman: Wan Sabri Wan Mansor, PhD

Faculty: Forestry

The Recreation Forests of Malaysia are mostly frequented by the middle income residents. It was shown that there are numerous visitors to these sites especially during the weekends. The study looks at the effects of recreational settings, which are the natural resources conditions and the crowding conditions on visits' satisfaction. The excessive use was found to have affected the natural resources and the crowding levels were found to be very high. However, the study found that visitors are still highly satisfied with the recreation experience.

Visitors' perceptions of the environmental conditions were assessed for three Recreation Forests namely Sungai Chongkak, Lentang and Sungai Tua which are popular among the population of the Klang Valley. Visitors' preferences and awareness were compared to actual conditions of the Recreation Forests.



Findings on awareness, shows that visitors are more aware of the plant component resource more than the other parameters. By groups, it was found that age seems to be a factor in perceiving environmental conditions, where the older people tend to be more aware of the situation.

Visitors' environmental preferences are more towards general conditions in term of cleanliness from rubbish and the availability of recreation facilities. They are less affected by crowd as indicated by what they consider as "pollutants" of the Recreation Forests. It was found that visitors object more to hearing noise from other visitors than seeing the crowd.

On placing importance, measured in terms of money and walking distance, visitors would rather spend more for cleanliness than for solitude. They are willing to pay up to RM 1 for cleanliness, which was encouraging as the mode. However, nothing at all is willing to be spent for solitude. More visitors are willing to walk for cleanliness (500 m) but not at all for solitude conditions. This again emphasised the lack of importance of solitude, or the lack of aversion to crowd by Recreation Forests' visitors. In fact, when asked what is their crowd tolerance limit, most visitors answered "Do not care".

Another finding from this study, is that campers which include visitors of challenging activities are quite different in their perceptions and preferences of environmental conditions. The limit of crowd tolerance is less, and this group made up the most willing to pay up to RM 10 and walk up to 1 km.

In conclusion, it was found that the recreational settings do indicate excessive use of the area. The natural ecology of the areas is significantly affected, and crowding is intense. It was found that, visitors noticed the conditions of crowding more than the natural resources'. Nevertheless, the majority of visitors are still very satisfied of the recreation experience in the Recreation Forests.



**Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan ijazah Doktor Falsafah.**

**PERSEKITARAN TIGA HUTAN LIPUR DAN KESANNYA TERHADAP
PERSEPSI PENGGUNA REKREASI**

Oleh

NOOR AZLIN YAHYA

Mac 1999

Pengerusi: Wan Sabri Wan Mansor, PhD

Fakulti: Perhutanan

Hutan-hutan Rekreasi di Malaysia merupakan kawasan rekreasi yang popular di kalangan golongan berpendapatan sederhana. Pemerhatian telah menunjukkan terdapat kepadatan pengunjung yang tinggi terutamanya pada hujung minggu. Kajian ini menyelidiki keadaan persekitaran dari aspek sumber-sumber semulajadi serta kesesakan, dan kesannya terhadap kepuasan rekreasi. Aktiviti rekreasi dikenal pasti telah meninggalkan impak ke atas sumber-sumber semulajadi serta terdapat kesesakan yang amat tinggi di hutan-hutan rekreasi yang dikaji.

Penyelidikan rekreasi pengunjung ke atas keadaan persekitaran telah dijalankan di tiga Hutan Rekreasi yang popular dikalangan penduduk-penduduk Lembah Klang. Hutan-hutan Rekreasi ini ialah Sungai Chongkak, Lentang dan Sungai Tua. Kajian mengenai kepekaan mendapati pengunjung adalah lebih peka terhadap keadaan tumbuh-tumbuhan di kawasan tersebut berbanding faktor-faktor

persekitaran yang lain. Jika dibandingkan antara kumpulan sosio-ekonomi, didapati umur merupakan satu faktor dalam persepsi persekitaran, dimana pengunjung yang lebih berumur didapati lebih peka kepada keadaan sekitar.

Pengunjung didapati lebih berminat terhadap faktor-faktor persekitaran yang am seperti kawasan yang bersih dari sampah sarap atau kemudahan di kawasan yang disediakan. Kesesakan di kawasan rekreasi bukan merupakan masalah kepada pengguna yang tidak menganggapnya sebagai satu faktor pencemaran. Juga di dapati, pelawat lebih tidak gemar kepada kebisingan yang diakibatkan oleh pelawat lain berbanding melihat kesesakan pelawat.

Dari segi keutamaan, berdasarkan kesanggupan untuk membayar dan berjalan kaki, pengunjung lebih sanggup membayar dan berjalan untuk mendapatkan kawasan yang bersih, berbanding untuk ke kawasan yang tidak sesak. RM 1 merupakan mod yang sanggup dibayar untuk kebersihan kawasan. Walaubagaimanapun, mereka tidak sanggup membayar apa-apa untuk menghindari kesesakan. Pengunjung juga sanggup berjalan sejauh 500 m untuk menghindari kawasan yang kotor tetapi tidak sanggup berjalan lebih jauh untuk menghindari kesesakan. Ini membuktikan pengunjung lebih menghargai kebersihan berbanding kawasan yang sunyi. Lebih ketara lagi, apabila ditanya had bilangan toleransi kesesakan, kebanyakan pelawat tidak mementingkan akan bilangannya.

Satu lagi hasil kajian ini ialah pengunjung-pengunjung yang berkhemah, termasuk yang melakukan aktiviti yang mencabar, adalah didapati agak berbeza

dalam persepsi dan keutamaan dari segi persekitaran. Had bilangan toleransi adalah lebih rendah dari kumpulan pengunjung lain dan kumpulan ini mempunyai peratusan yang lebih besar yang sanggup membayar sehingga RM 10 dan berjalan sejauh 1 km.

Kesimpulannya adalah didapati, walaupun keadaan sumber telah terjejas dan kesesakan rekreasi adalah amat tinggi, pengunjung masih berpuas hati dengan pengalaman rekreasi di hutan-hutan lipur.

CHAPTER I

INTRODUCTION

Background

A Recreation Forest or an Amenity Forest is a forest designated for public recreational use which was conceptualised during the First Malaysian Plan (1966-1970). The first two sites established under this designation were Sekayu Recreation Forest in Terengganu State and Telok Bahang Recreation Forest in the state of Penang (Jalil and Chee, 1983). The Recreation Forests are designated and managed by the Department of Forestry. As of 1997, there are 84 Recreation Forests encompassing an area of 6,723 ha covering all states in the peninsula (Malaysia, Department of Forestry, 1997). These accessible areas of scenic beauty comprise about 0.05% of the total 12.7 million ha of permanent forest estates in Malaysia.

Even prior to the designation of the first Recreation Forest, many forest reserves gazetted since the Forestry Act of 1934 were already utilised for recreational purposes. Templer Park and highland forests such as Fraser's Hill and Cameron Highland were very popular as holiday retreats ever since the colonial time (Wan Sabri, 1987). As a component of a Permanent Forest Reserve, the concept of Recreation Forest was first described in the National Forestry Policy



(Malaysia, Department of Forestry, 1978) as the conservation of adequate forest areas for recreation, education, and the protection of the country's unique flora and fauna.

With the National Forestry Act amendment in 1992 (Malaysia, Department of Forestry, 1992), the objectives of Recreation Forests were slightly modified. Its redefined purposes are to conserve enough area as places for recreation, ecotourism and to enhance the public's awareness on forestry.

Referring to the National Forest Policy and its 1992 amendment, Recreation Forests can be described as areas designated for conservation of local flora and fauna as well as areas where environmental education can be conducted. Recreation Forests set up specifically for educational purposes, such as Hutan Lipur Rantau Abang in Terengganu, are gaining importance. However, it is observed that currently Recreation Forests are mainly serving the first function, that is for passive recreational activities.

Serving as affordable settings for outdoor recreational activities, Recreation Forests of Malaysia attract a large number of visitors. The increase in recreational needs could be due to the rising number of the population, increase of leisure and money, as well as the upward trend in nature appreciation. Jalil and Chee (1983) stated that over 100,000 visits were received at Hutan Lipur Telok Bahang and Sekayu per annum, based on entry counts since 1983. Entry counts observed in 1991 and 1992 estimated a total of 318,000, 466,000 and 371,000 visits per annum