

Local Economic Benefits of Ecotourism Development in Malaysia: The Case of Redang Island Marine Park

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ABSTRACT

This paper is an empirical study of the local economic benefits of ecotourism development in one of the marine parks in Malaysia. The Redang Island Marine Park (RIMP) was selected as a case study in order to estimate local economic benefits in terms of employment opportunities provided by the ecotourism sector and other related sectors. Sixteen ecotourism operators were interviewed to elicit financial information while 82 employees involved in the ecotourism sector were also interviewed in order to determine expenditure patterns. The results showed that the development of ecotourism in RIMP has definitely generated local employment opportunities. A total of 938 jobs were created which included direct, indirect and induced employment. The output multiplier was very small compared to the employment multipliers which were 1.104 and 1.223 respectively. The high percentage of leakages in the expenditures of ecotourism operators and their employees had contributed to the low multiplier effects.

Keywords: Ecotourism; sustainable development; marine parks; economics impacts; employment; economic multiplier; economic benefits.

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Any remaining errors or omissions rest solely with the author(s) of this paper.

INTRODUCTION

Generally, in developing countries such as Malaysia, there have been only few quantitative studies about the impact of local tourism and ecotourism income. Much of tourism and ecotourism literature has dealt extensively with the environmental impacts of tourism or ecotourism rather than giving due attention to economic aspects. Even though economic aspects are highlighted by some of the studies, they mostly focus on quantification employing environmental economic tools such as the Travel Cost Method (TCM), Contingent Valuation Method (CVM) and Choice Modelling (CM) with the aim of measuring consumer welfare gains rather than the direct financial flow. A study of the economic impacts of ecotourism locally, allows quantification of the local cash flows from ecotourism development, and involves among others analysis of income structure, spending and impacts on local development.

Studies on the economic impacts of ecotourism development tend to emphasize on the positive benefits of ecotourism. The economic impacts of ecotourism development on the local population can normally be viewed in terms of income generation, employment opportunities, business opportunities, etc. The estimation of these upstream and downstream impacts is widely used to estimate the benefits of ecotourism development to the local economy. The contribution of ecotourism activities to the local economy can be measured by economic analysis. Normally, the economic analysis traces the flow of spending associated with tourism or ecotourism activities in a region to identify change in sales, tax revenues, income and jobs due to these activities. There are many ways to measure the economic benefits of tourism and ecotourism. The principal methods are visitor spending surveys, analysis of secondary data from government economic statistics, economic-based models, input-output models and multipliers (Stynes, 1997).

The more common approaches for estimating economic impacts of tourism or ecotourism (economic benefits, in this case) are the multiplier methods and the input-output (I-O) models. The multiplier approach uses either aggregate or sector-specific multipliers to estimate changes in economic activities due to visitor spending (Wagner 1997). As the main objective of this study is to estimate the economic benefits of ecotourism development in RIMP to local people, an economic multiplier method will be adopted.

The main purpose of this study is to estimate the economic benefits of ecotourism development in RIMP, to ecotourism operators and local people, in terms of income and employment opportunities. The boundaries of this study are limited to the RIMP alone. The economic benefits will be segregated to reflect three main impacts. First, the direct impacts generated by ecotourism operators; second, the indirect impacts generated through the expenditures of ecotourism operators for their inputs, and lastly, the induced benefits resulting from the expenditures of employees' incomes spent locally.

ECOTOURISM DEVELOPMENT IN REDANG ISLAND MARINE PARK

RIMP is situated in the South China Sea, off the north-eastern coast of the State of Terengganu, Malaysia. This marine park comprises the main island, Redang Island, and 8 islets. These are Pinang Island, Lima Island, Ekor Tebu Island, Kerengga Kecil Island, Kerengga Besar Island, Paku Besar Island, Paku Kecil Island and Ling Island. The main form of accessibility to RIMP is via boats, ferries and speedboats that depart from the jetties in Kuala Terengganu and Merang, and involves a journey of about one hour.

The population of the island is about 1,200. The local population are either fishermen with an average monthly income of RM350 to RM450 or involved in the tourism sector which provides an average income of RM500 to RM700 per month (Economic Planning Unit, 2003). Some of the local population rent their land as turtle nesting areas, earning substantial revenue each year from the rents received or from the sale of turtle eggs and birds' nests. Over the years many members the local communities have shifted from fishing to ecotourism-related activities, which could provide greater economic benefits (Liew, 2002).

The primary goal of the establishment of marine parks is to provide an area for the protection and conservation of marine resources and habitats, and to function as a management tool, aiding the drive towards sustainability in the fishing industry (Department of Fisheries, 1996). At the moment, there are 16 chalets and resorts in RIMP offering about 900 rooms with a range of categories that includes 252 luxury rooms. There is also a nine-hole golf course on the island (EPU, 2003). Camping sites are also available, for the more adventurous tourists and backpackers,

at Teluk Kalong. The Fishery Department has also established privatised and commercialised chalets at the marine parks centre on Pinang Island. Activities like snorkelling and scuba-diving are also popular attractions for tourists on the island.

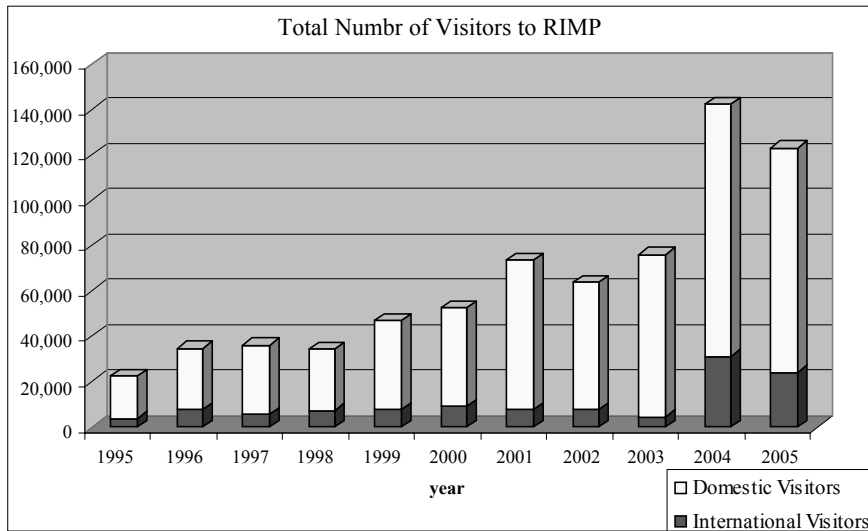


Figure I Total Number of Visitors to RIMP



Figure II Redang Island Marine Park and Surrounding Islands

RIMP is becoming an increasingly important ecotourism destination in Malaysia. For example, in 1990, RIMP was visited by just a few hundred people. This increased on a yearly basis, and in 2001 it received more than 73,000 visitors (Figure 1). This overwhelming increase in visitor numbers now poses a serious challenge to the park management, which must cater for the needs of the tourists whilst ensuring that economic concerns, environmental awareness, marine ecosystem protection and conservation are maintained.

THE ECONOMIC BENEFITS OF ECOTOURISM DEVELOPMENT IN RIMP

The International Resource Group (1992) stated that while tourists from Europe and North America like to visit developing countries includes Malaysia, Thailand or Indonesia, they however spent only one-third of their travel costs in the destination countries. Most of the remaining two-thirds were absorbed by international airlines and tour operators. From the one-third which was spent in the destination country, again, a major part of this was spent in the capital cities such as Kuala Lumpur, on accommodation. Only a very small proportion was channelled to the target area, in particular ecotourism sites such as RIMP, where the local population and ecotourism operators were located.

Estimating the economic benefits has been the main focus of impact analysis of ecotourism. In economic impact analysis of ecotourism the focus is on establishing the linkages between visitors, ecotourism operators and local enterprises. On a wider scale, the indicators of economic benefit to a nation or region's economy would be measured by a few methods that include:

- i. Income generated and contribution to Gross National Product (GNP) and Gross Domestic Product (GDP)
- ii. Foreign exchange earnings
- iii. Local employment generated
- iv. The multiplier effect i.e the effect of initial tourist spending in generating other economic activities in the economy
- v. Contribution to government revenues through various taxes and duties

As for the impact of ecotourism development on the local economy, it is usually measured in terms of income or profit received by local ecotourism operators, local enterprises and local employment generated.

Although the employment multiplier relates employment to tourist expenditure, in the case of RIMP it refers to employment created by ecotourism operators. Employment creation can be measured in terms of full-time equivalent jobs or the actual number of jobs including part-time jobs. Both provide valuable information about the labour requirements of ecotourism development in RIMP in terms of quality and types of job.

The multipliers can be expressed in two main ways: Type 1 and Type 2 multipliers. Type 1 multipliers refer to multipliers which exclude induced effects. On the other hand Type 2 multipliers include direct, indirect and induced effects. Type 1 multipliers are calculated without induced effects because the induced effects are often small in comparison to the direct and indirect effects (Stynes, 1997). In this study, economic change measures are estimated from the impacts of ecotourism development in RIMP where the output multiplier and employment multipliers are considered. The multipliers defined above are called ratio type multipliers as they measure the ratio of a total effect measure to the corresponding direct effects (Archer, 1996). The calculation of output, income and employment multipliers uses the same principle.

Multiplier analysis is often cited to capture the secondary effects of tourism spending (ecotourism in this case) and to show the wide range of sectors in the community which may benefit from tourism. The total economic impact of ecotourism development is the sum of direct, indirect and induced effects within the region. There are three levels of effects involved, direct, indirect and induced in relation to the sectors involved, to estimate the multiplier in RIMP, Malaysia.

Direct effects are changes in ecotourism development directly associated with visitor spending. For example, visitors spending their money with ecotourism operators for their lodging in RIMP will create direct revenue for the ecotourism operators (i.e. chalets, resorts and hotel operators). This is the direct revenue or direct output effect of visitor spending. A proportion of this revenue is used to pay suppliers. The income that remains, once all inputs have been accounted for

(includes wages, salaries and profits), is the direct income. Similarly, the direct employment created is the number of people who are directly employed in the tourism and ecotourism development activity.

Indirect effects can be viewed as the purchases or expenditures of ecotourism operators from other businesses or suppliers, giving rise to the indirect effect. Income that is retained by these suppliers, after inputs are paid for, is the indirect income. Employment created in these businesses resulting indirectly from visitors expenditure in RIMP is known as indirect employment. For example, ecotourism operators in RIMP purchase goods and services (fish products and boat rent) from local people as part of their annual expenditure in RIMP to fulfil their goods requirements and to cater for their customers during peak season. The fishermen and local boat entrepreneurs get their income from supplying these inputs. They spend their income in the local area. Furthermore, they also hire local people to work with them. The link and associated income and jobs generated from these revenues are indirect effects.

The third type of effect, *induced effect*, results from the re-spending of wages and revenues earned directly or indirectly from ecotourism within the local economy. The income of local people rises due to earnings from visitor expenditure while purchases from local businesses add to the income and employment that is generated from ecotourism, thus generating induced income and induced employment. Induced effects are income, output or employment resulting from employees' and households' spending of income earned as a result of direct or indirect effects. The employees of ecotourism operators, locals involved with fishermen and boat entrepreneurs, for instance, will spend their wages and salaries in RIMP and generate a new round of output, income and employees. However, in this study, only the first round and second round effects will be estimated.

METHOD AND DATA COLLECTION

In this study information and data to estimate economic impacts was obtained through personal interviews with ecotourism operators, conducted from May to June 2004. The information is divided into two sections: the first section encompasses information on ecotourism operators, including all chalets, hotels and resorts, with regards to revenues and expenditure of their businesses. The

second section concerns information on employee expenditures, on those who work directly with ecotourism operators.

The information from ecotourism operators can be divided into two parts; first, the information about employees and second, the financial aspects of their businesses. The operators were asked for the number of full-time and part-time employees employed. Detailed information on each type of job, position and origin of employees was also included in order to determine the percentage of employment provided to locals. Information on the financial aspect of resort operations was very difficult to obtain due to the confidential nature of the information. The expenditure items included were salaries and wages, non-durable goods, food and drink, utilities, communications, marketing and promotions, maintenance, other services, land rental or loan interest, equipment rental, and miscellaneous expenses. They were also asked about expenditure on local products from RIMP, and the main types of goods purchased locally.

The information on estimated employees' household expenditures from their income is used to determine the percentage of local spending. The sample of employees chosen was between 8 to 10 employees from each resort, ranging from general workers up to top positions. The employees were asked how they spend their income at three locations; Redang Island, Terengganu and other states. A total of 82 employees were interviewed in this study.

RESULTS

Impacts of Ecotourism Operators

The results of the interviews of ecotourism operators in RIMP and the information collected revealed total direct employment of 765 employees which comprised 86% full-time and 14% part-time employees. Two main resorts accounted for about 50% of the employment opportunities i.e. Berjaya Redang Beach Resort and Laguna Redang Island Resort. These two resorts also accounted for all the part-time employment which was utilised as support services during peak seasons. The majority, i.e. 47%, of the full time workers are locals from RIMP, 42% of the employees were from Terengganu and 11% from other places (other states in Malaysia and foreigners). Most of the locals work in middle and lower income

categories. Part-time employees were assumed to be equivalent to employees in full-time employment. This assumption is based on a few factors - firstly, the wage rate for the part-timers was 20% higher than the full-time rate; and secondly, the part-time workers work for almost the full period of business operations, meaning that they normally work for eight months as the resorts are only closed for the monsoon season from November to March every year.

The total revenue earned by the ecotourism operators in 2003 was RM32.33 million with the Berjaya Redang Beach and Laguna Island Resorts accounting for 35% and 24% of the total revenue respectively. Both of these resorts have more than 200 rooms and are categorised as four star accommodation in terms of their facilities and services. Meanwhile, the other ecotourism operators provide middle and low class accommodation, each having fewer than 80 rooms. The revenue of middle class operators is based on their performance and the result of good marketing strategies in selling their packages. Based on the Ecotourism Operators' Survey 2004, most of the middle class operations located along Pasir Panjang (except Redang Lagoon Resort and Redang Holiday Resort) are owned by ethnic Chinese. Most of the top management positions in these resorts are also filled by ethnic Chinese. These middle class operators prefer to market their packages and services to Chinese tourists especially from Singapore, Hong Kong and China (Redang Bay Manager, Personal Comm, 2004).

The total and percentages for each expenditure item are summarised in Table I. The expenditure for non-durable goods (soap, towels, tissues etc.) comprises 1.7% of total expenditure. Most of the goods are purchased in Terengganu (77%), except by Berjaya Redang Beach which receives supplies from Kuala Lumpur. Expenditure on food and beverages comprises 17.1%, with an average of 68% bought in Terengganu. Some drinks like beer etc., are supplied from Kuala Lumpur or Singapore. Expenditure for utilities (gas, electricity, fuel etc.) comprises 9% of total expenditure and is exclusively spent in Terengganu. The expenditure for communications (telephone, fax etc), and marketing and public relations form 1.2% and 4.1% respectively.

Expenditure on equipment rental and fishery products are both categorised as local expenditure forming a small percentage of 0.5% from total expenditure. Purchases of these items, however, are made by just a few resorts i.e. Coral Redang,

Redang Reef and Laguna Island Resorts. The money is spent to hire local boats for their visitors during peak season, and special boats from local people for sport fishing during the squid season. Meanwhile, expenditure on fish products by Redang Reef and Laguna Redang Resorts is for the purchase of local fish for their restaurants.

The estimate of the output multiplier is based on the flow of revenue and expenditure of ecotourism operators in RIMP. Flow of revenue comes from the expenditures of visitors on transportation, accommodation, food and beverages, souvenirs and outdoor recreation activities spent in RIMP. The total output of other local businesses is derived from the expenditure of ecotourism operators on equipment rental and fishery products produced locally. The output in the form of equipment rental such as boat rentals comes from just three ecotourism operators, Coral Redang Island, Laguna Redang Island and Redang Reef Resorts. Meanwhile, the output from fishery products is related to the expenditure of Laguna Redang Island and Redang Reef Resorts. The contribution of local outputs created was small (0.31%) resulting in a small output multiplier (Table I). Lack of local industries or inputs to generate local output gave a small value of Type 1 output multiplier. Furthermore, among the ecotourism operators in RIMP, only three operators contributed to local output (Coral Redang, Redang Reef and Laguna Redang Island Resorts).

Before the calculation of the Type 2 output multiplier, it is essential to determine the additional income and wages of local people resulting from the creation of local businesses. In this case, additional income and wages is gained from the creation of local employment in boat enterprises and fishery supplies. In this estimation, the regional multiplier was applied by multiplying with the output from the local businesses. The output multiplier was 1.007.

Impacts of Employment

The total number of employees interviewed was 82, which is about 11% of total employment in RIMP. The percentage of the sample obtained was reliable and reasonable for estimating the employment multiplier. Based on the 10 types of expenditure items, every employee was required to provide information on their monthly spending (from their income) in RIMP, Terengganu and other states. The

Table I Impact of Ecotourism Operators

Items	RM	RM
A. Total Output of ecotourism operators ¹		32,327,000
B. Total Input		22,224,800
B1. Salary, wages and benefits	13,637,000	
B2. Non-durable goods	371,300	
B3. Foods and drinks	3,800,600	
B4. Utilities	1,998,300	
B5. Communication	276,800	
B6. Marketing and Promotions	920,300	
B7. Maintenance and facilities	456,500	
B8. Other services	264,700	
B9. Land rentals and loan interest	25,000	
B10. Equipment rented locally	61,000	
B11. Fish products bought locally	41,000	
B12. Miscellaneous	372,300	
C. Net Profits (A-B)		10,102,200
D. Total Output spent locally (B10+B11) ²		102,000
E. Percentage output spent locally (D/A)		0.32%
F. Additional Income generated locally (D*Regional Multiplier) ³		111,000
G. Number of additional jobs created if each job is RM 8,714.30/ years (F/RM8,714.30)		12.73
H. Type 1 Output Multiplier		1.003
I. Type 2 Output Multiplier		1.007

¹ Total output of 13 ecotourism operators in RIMP in 2003; Berjaya Redang Beach, Redang Holiday Beach Villa, Coral Redang Island, Redang Pelangi, Ayu Mayang, Redang Bay, Redang Lagoon, Redang Beach, Redang Reef, Laguna Redang Island, Redang Kalong, Mozana and Redang Mutiara

² Expenditures spent locally by Coral Redang Island, Redang Reef and Laguna Redang Island for fish products and boat rent during peak seasons.

³ The regional Multiplier is 1.0878 (Mohd Rusli, 2006)

average employee monthly income was RM 871.43 (1RM=£0.14, in 2004). The estimation of annual employee income is based on eight months' fully-paid salary and basic salary for the four months during operational closure in the monsoon season from November to March. The basic wage rate is assumed to be half the monthly rate. Total annual income was estimated at RM 8,714.30.

The average employee spent 19.2% of their income in RIMP, i.e. approximately RM167.08 per month. The highest percentage spending of their income was in Terengganu which amounted to RM602.44 per month i.e. 69.1% of their salary. Expenditure in other states was RM101.84 (11.7%). The higher percentage of spending in RIMP might be accounted for by the fact that the area is located far from the mainland (60 km) with the main means of transportation being by boat. This situation encourages employees to spend their income purchasing some items from local shops and grocery stores. The expenditure on food and beverage in local shops and grocers was 43.4%, for other expenses it was 27.7% and for household bills it was 12.4%. The other six expenditure items total to less than 5%. The allocation for savings of just 5% of monthly incomes saved was due to the unavailability of financial institutions like banks or post offices on RIMP.

On the other hand, the employees spend 69.1% of their income in Terengganu because it is the nearest town to RIMP (Table II). Even though a higher rate of spending in Terengganu was indicated, 39% is in savings, 16.8% is spent on food and beverage, 15.7% on other expenses and 11.2% for clothes. However, it must be stated that although the percentage of spending in Terengganu is higher, it is not only contributed to by employees from Terengganu but also by people from elsewhere. If facilities and industries in RIMP were to increase, and there is a reduction of imported goods and services, the percentage of spending in Terengganu might decrease.

The employment multiplier measures the total change in local employment resulting from employment opportunities with ecotourism operators in Redang Island. Information on direct employment is obtained through the Ecotourism Operators' Survey 2004, as shown in Table III. Direct employment means the total number of employees directly involved in ecotourism operations. The results show that more than 50% of direct employment is by Berjaya Redang Beach and Laguna Redang Island Resorts.

Table II Monthly Employee Expenditures (N=82)

Expenditure Items	Redang		Terengganu	
	RM	%	RM	%
House rent	4.27	2.6	21.95	3.6
Utility bills (electricity, telephone, etc)	20.73	12.4	27.44	4.6
Foods and beverage	72.56	43.4	101.22	16.8
Hair dressing and accessories	0	0.0	3.66	0.6
Entertainment	8.54	5.1	25	4.1
Recreation, leisure and sports	0	0.0	1.22	0.2
Travelling (boat fares)	3.66	2.2	25	4.1
Dresses	3.05	1.8	67.68	11.2
Saving	7.93	4.7	234.76	39.0
Other expenses	46.34	27.7	94.51	15.7
<i>Total</i>	<i>167.08</i>		<i>602.44</i>	
<i>Percentage</i>	<i>19.2</i>		<i>69.1</i>	

Table III Impact of Employment

Items	Total
A. Total Expenditure for wages, salary and benefits	RM 13,637,000.0
B. Direct employment by ecotourism operators	765
C. Total employee income RM/year ⁴	RM 8,714.3
D. Total employees take home income (B × C)	RM 6,666,210.0
E. Total Income spent locally (D × 19.2%) ⁵	RM 1,279,912.3
F. Additional income generated locally (E × Regional multiplier) ⁶	RM 1,392,288.6
G. Number of additional jobs created if each job is RM 8,714.30 year (F/RM 8,714.30)	159.8

Indirect employment was estimated by using information on income/output in relation to number of jobs created by local businesses in RIMP. The additional income generated from local outputs divided by the assumed annual income, after

⁴ Based on employee survey results, average monthly income was estimated at RM871.43. The totals of annual income are based on 8 months full pay and 4 months half pay due to operational closure during monsoon season.

⁵ Based on the employee survey results an average of 19.2% of their income is spent locally

⁶ Estimated of Regional Multiplier was 1.0878 (Mohd Rusli, 2006)

stimulation with each job is assumed at RM 8,714.30 per year, and thus the number of additional jobs is estimated. The results on indirect employment are presented in Table III. Total indirect employment for all ecotourism operators in RIMP was 12.

Induced employment was estimated by using the information on annual take-home income to determine percentage of local spending. Total take-home income was multiplied by the percentage of income spent locally, and thus total income spent locally is estimated. Total additional income spent locally was estimated by multiplying income spent locally with the regional multiplier. The estimation and calculation of the regional multiplier in this study is explained in detail in Appendix 1. The estimates of induced employment made after dividing by the additional income spent locally by the assumption of the number of additional jobs stimulated was 8,714.30 per year. Results for induced employment are better than for indirect employment as reflected by the number of jobs created. The higher results of induced employment are positively related to the direct employment effects from ecotourism operators and the higher percentages of income spent locally.

The results of Type 1 and Type 2 employment multipliers are shown in Table IV. The Type 1 employment multiplier is estimated extremely low with 1.04 for Laguna Redang Island Resort and 1.051 for Redang Reef Resort. Meanwhile, the highest employment multiplier was 1.091 from Coral Redang Island, and the rest of the ecotourism operators show the same results. The average Type I employment multiplier was 1.014. On the other hand, results of the Type 2 employment multiplier were slightly higher than that of Type 1 with the range of multipliers ranging from 1.209 to 1.299.

Table IV Total Employment Impact

Impacts	Total
A. Direct employment	765
B. Indirect employment created from EP spend output locally	13
C. Induced employment created from employees spending locally	160
D. Type 1 employment multiplier $(A+B)/A$	1.104
E. Type 2 employment multiplier $(A+B+C)/A$	1.223

DISCUSSION AND CONCLUSIONS

The main profits or benefits of ecotourism development in RIMP are to ecotourism operators (hotel owners). Currently, there are 16 hotels and chalets operating in RIMP which provide nearly 1000 rooms to visitors. The findings of the study show that, in 2003 with an influx of 71,654 visitors to RIMP, a net economic profit of RM10 million was generated by ecotourism operators (Table I).

The development of ecotourism in RIMP created employment opportunities for locals. These employment opportunities are not only limited to the involvement of local people with ecotourism operators but also includes involvement in other sectors which are related to ecotourism industries (Ahmad Shuib *et al.*, 1994). The finding of the study was that total employment created in RIMP from ecotourism was 937 employees, with 765 direct employees with the ecotourism operators, 12 indirect employees in related sectors and 160 induced employees.

The low impact of indirect employment from ecotourism development in RIMP may be due to two factors. First, most of the expenditure of ecotourism operators on goods and services for their operations is on imports. For example, as shown in Table I, only 0.5% of their total expenditure, contributed by three ecotourism operators, was made in the local area. Thus, a very small proportion of their expenditure is retained in the local area to be re-circulated to affect the local economy.

Second, a large proportion of employees' expenditure leaks out from RIMP. This occurs because only 19% of employees' income and wages was spent locally. Unavailability of local enterprises and services such as dress shops, entertainment shops, salons etc forced the locals' or employees' expenditure out of RIMP. Even though 19% of employees' income and wages was spent locally, most of the expenditure items was for food and beverages (Table II). In reality, most of the raw material used in local restaurants and food stalls are also imported. In this case, the money spent by employees leaked out again.

Based on these two factors, the low impact on local economies is reflective of a high proportion of leakages. However, as ecotourism development in RIMP is actually a Federal undertaking, as far as the Federal government is concerned, the relatively high leakages may not be a major problem. After all, items used in the RIMP, either by ecotourism operators or local people, are made in towns in the

region, in Terengganu or Kuala Lumpur for example, but are still within national boundaries. Thus, the leakages are viewed merely as a redistribution of income.

The socio-economic activities of the locals is basically fishery-based. However, almost all the fish products used by ecotourism operators and locals have to be imported from outside the region. Ecotourism operators' expenditures in the local economy (equipment rental and fish products) formed only 0.5% of total expenditure of RM 22.2 million in 2003. If local fishermen could supply more of the fish products that ecotourism operators and local people (restaurants and food stalls) require, the impact on the local economy will be further enhanced. The same can be said for handicraft shops, souvenir shops, tailor shops, salons and entertainment shops. If proper facilities and incentives are given to the local population, these sectors can become an important nucleus in the growth of the local economy. For example, if the local people are given incentives to operate salons and tailor shops, it not only fulfils the basic requirements of locals but also of the employees of ecotourism operators in RIMP. Hence, providing this basic requirement may generate local economy impacts.

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APPENDIX 1

Determination of Keynesian Multiplier for RIMP

The Keynesian Multiplier requires estimation of the multiplier effect of employees (household) expenditures from their income or wages from ecotourism operators in Redang Island. The formula for the Keynesian Multiplier (K_r) is expressed as:

$$K_r = \frac{1}{1 - C(1 - T_d - U)(1 - M - T_i)}$$

Then, we need to derive the values for:

- C = Marginal propensity to consume
- T_d = Direct tax or national insurance contributions
- U = Percentage decline in transfer payment (e.g. unemployment)
- M = Proportion of spending on goods imported into the region and
- T_i = Indirect tax rate.

The reliable survey responses of employees on their income and expenditures in Redang Island (11% from total employees), for each category of position, provides a good indication to estimate the value of marginal propensity to consume, C. From the employees' survey of 11% of total employees in Redang Island, 86% were full time and 14%, part time workers. The part time workers are in just two main resorts, Berjaya Beach and Laguna Redang Island Resorts. This island has about 16 hotels and resorts. The employees' breakdown comprises 47% locals, 42% from Terengganu state and the rest from other states. Some of the resorts also employed foreign workers such as those from Indonesia, Nepal, Myanmar and Thailand. However, most of them work at the lower income categories such as general workers, cleaner and security guards.

Based on the employees' expenditure survey results, the average annual take home income of the employees was RM8,714 (1RM=GBP0.143 in 2004). From this income, however, an average of 19.2% was spent in Redang Island. This percentage is higher than expected because almost half of the employees are local people. The average percentage for saving was 26% which means that the marginal

propensity to consume is 74%. However, the MPC is expected to be much higher based on a few factors. Firstly, as the ecotourism businesses operating in Redang Island, via accommodation and services provided by hotels and resorts, employ many full time workers i.e. 86% of total employees, this condition will increase marginal income to employees and households. Thus, the marginal propensity to consume will increase. Secondly, most of the employees are from Redang Island (47%) and thus, they are able to spend their income rather than save because most of the goods are imported. They also have alternative jobs such as running their own business and as fishermen. Thus, it can increase the marginal household income and directly increase MPC. Due to these conditions, it is reasonable to estimate the MPC is 0.85.

The rate of direct taxation of employees depends on their resident status. In Malaysia, the employee is taxed on his chargeable income at graduated rates from 2% to 30%, after deduction of tax relief (IRBM, 2004)⁷. However, employees with chargeable income of less than RM2,500 per month (equivalent to £360), are taxed at zero rate. The direct tax or income tax paid by the employees reduces the amount of payroll spent in the local economy. The result of the employee survey in Redang Island showed that the majority of the employees are in the lower income categories, thus their taxable income is assumed to fall to 5%.

The Malaysian unemployment rate is about 3.5 to 3.8 (IRBM, 2004). However, the determination of the unemployment rate will be considered within the study boundaries of the regional economy. Based on the resident profile of Redang Island, from a total population of 1500 people, 56% of the locals (15–54 year olds) fall under the category of 'economically active'. Based on the survey, 47% of the employees involved directly with ecotourism operators in Redang Island are locals. Furthermore, some of the locals also carry out own businesses related to ecotourism development. Consequently, the current unemployment rate is very low. Thus we can assume it to be zero.

Indirect tax in Malaysia is very difficult to estimate because most of the people consume a variety of goods based on their expenditure levels and income levels. In Malaysia, the indirect tax implemented is focused on sales tax, service tax,

⁷ The Inland Revenue Board of Malaysia, 2004.

excise duty and import duty. The general rate for sales tax in Malaysia is about 5% to 10% (IRBM, 2004). However, in this study, the assumption is that only indirect taxes focused on goods and expenditures will be considered. The sales tax is imposed at the import and manufacturing levels. Certain non-essential foodstuffs and building materials are taxed at 5%. Cigarettes and liquor are taxed at 15%. However, primary commodities, basic foodstuffs, basic building materials, agricultural implements, equipments and machinery are exempted. Certain tourist and sports goods, books, newspapers and reading materials are also exempted. Most of the goods involved in the employee expenditure survey in this study are exempted from tax. Thus, the value for T_d is assumed to be zero.

The results show that about 80% of employees spend their income outside of Redang Island, with 69% spent in Terengganu and the remaining 12% spent in other states. The location of Redang Island, situated 60km from the mainland, makes imported goods likely to be very high. Consumer utilities such as electricity, water, cooking gas, fuel etc are totally from the mainland. Food and beverage is also imported from the mainland and is unlikely to be produced locally. Entertainment materials such as cds, vcds, video tapes etc come totally from the mainland. Clothes and dresses also come from the mainland. However, remoteness might also increase dependence upon local personal services such as hairdressing. Only a small portion of products are produced locally such as coconut, fish and vegetables. However, it is not enough to supply the local market and more needs to be imported from the mainland. Hence, the estimate value of marginal propensity to import is assumed to be 0.90. Some of the examples of values used for calculating the Keynesian Multiplier are shown in the table below.

Some Examples of the Keynesian Multiplier and Values Used for RIMP

Types of Value	Example 1. ⁸	Example 2 ⁹	Redang Island
C	0.9	0.85	0.85
Td	0.2	0.248	0.05
U	0.15	0	0
M	0.55	0.80 & 0.70	0.90
Ti	0.15	0.087	0
Kr	1.213	1.078	1.0878

⁸ G.D. Garrod and K.G. Willis (1999). The Economic Impact of agriculture and Horticulture in West Lancashire District. Report to the Lancashire Area West Training and Enterprise Council (LAWTEC) Rural Action group. Department of Agricultural Economics and Food Marketing, Newcastle University.

⁹ ADAS Consulting Limited and University of Newcastle (2003). Renewable Energy and its Impact on Rural Development and Sustainability in Wolverhampton, United Kingdom.
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