論文

Natural and Consequence of Tourism Industry's Susceptibility to Natural Disaster – A Conceptual Framework using Input-Output Model

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ABSTRACT

Tourism business plays an important role in developing a region's economy. Most of the operators are small businesses and are highly vulnerable to disaster. On top of bearing the direct loss such as personal asset damages, impacted and adjacent communities are concerned of the possibility of losing their jobs and future incomes due to business interruption between the primary and secondary industries. The government's receipts of tax revenue would be disrupted as well. Despite recognition of indirect losses, the disaster literature's focus had been on estimating the direct damages to local residents. Literature that studied impacts on the business community tended to focus on those that originated from the disruption in the economic system – such as economic recession rather than environmental disaster. Compared to direct losses, indirect losses are more difficult to estimate because of the complex task in obtaining relevant data to measure the multiplier impact, especially in smaller regions. This study extended the literature by highlighting a way to measure the indirect effects of natural disasters on the tourism and secondary industries and its local and adjoining communities. This study hopefully could contribute to a better understanding – by tourism industry analysts as well as public officials – of the trail of economic effects and its implications of carrying or not to carry-out restoration work.

Keywords: Economic impact of disaster, Primary and secondary industries, Interregional trade, Input-Output analysis

INTRODUCTION

Tourism is a force that can help to develop other sectors in an economy. Tourist income spurs broader economic development through more infrastructure and service; and encouragement of investments in the secondary industries. Tourism provides very good opportunities for small businesses to earn additional income and creates additional job opportunities to the local community. Nevertheless, tourism destinations in Malaysia may be vulnerable to environmental disasters such as earthquakes, floods and landslide (Hall, 2010; Scott & Lemieux, 2010). For example, in June 2015, earthquake caused serious damages to Kinabalu Park – a popular tourism spot in Sabah, Malaysia – and its adjacent areas.

In disaster literature, economists have been estimating the direct and indirect loss. Direct loss refers to the immediate damages to physical structures, plantation (Hallegatte & Przyluski, 2010), and livestock to families and public agencies. Indirect loss shows the current and potential loss that needs to be borne by the community as a result of interruption in a local economy (Benson & Clay 2004; Rose, 2004; Rose & Liao, 2005). The disruption of tourism and its income will then reduce the government's tax revenue. Small businesses are highly vulnerable to disasters, especially when their products are mainly consumed by tourists (Webb et al. 2002). The impacted business may decrease the output production in which some employees may need to be laid off. The loss in earning additional income and employment indeed is a good proxy for economic welfare losses to communities living in the impacted and adjacent areas.

Despite severe consequences that can result from indirect losses, there has been relatively less research done to date on this subject in Malaysia. Unlike most of past researchers, the current authors extended the measurement of the indirect loss by segregating the indirect loss into two components: direct and indirect effects of the disaster. Direct effect reflects the losses in the creation of output, employment, and value added services due to the loss of tourists' expenditure. Indirect effect depicts the losses in terms of additional production and job creation for the local people as a result of the disruption of expenditure between the primary and secondary industries. Nevertheless, measuring the indirect effect of a natural disaster on tourism business is difficult because tourism involves the participation of different industries within an economy or a region and its adjacent region. The impacts of natural disasters such as earthquakes and floods extend to other regions through interregional trade. The closure of tourism business in the directly damaged region would affect the supplies of inputs produced by secondary industries located in the affected and other regions. The basic conclusion arrived at by the authors concerned is the inability of particular models in capturing all the dimensions and dynamic changes found in the tourism industry of different disaster areas. Perhaps this is one of the reasons why despite recognition of the indirect loss caused by disasters, there has been little research to date on this subject in Malaysia, especially in tourism business.

REVIEW OF ECONOMIC THEORY IN DISASTER AND BUSINESS COMMUNITY STUDIES

Literature that studied the economic impact of the business community tended to focus on the impact that originated from the disruption in the economic system – such as economic recession – rather than environmental disaster (Blakely & Bradshaw, 2002). Economic research in disaster literature has tendency to survey the highly aggregated units of analysis, such as measuring the national economic loss (Zhang et al. 2009). However, such higher levels of analyses may not represent the localized impacts on the business community of a small region and its effect on the local community (Zhang et al. 2009).

Large companies can recover faster if their markets are not concentrated in the impacted zone (Webb et al. 2002). Comparatively, it is not easy for small businesses to re-establish their operations because they depend mainly on tourists' expenditure. Tourism business located nearby the disaster area may be severely affected as well if most of their output is consumed by the tourists of the impacted area (Zhang et al. 2009).

The impact of environmental disaster on tourism business in Malaysia is less discussed in the literature resulting in the lack of preparedness among the local community and relevant policy makers. For local authorities and the government to safeguard the economic welfare of an impacted community, assessing the loss of output, income, and jobs is important (Hallegatte & Przyluski, 2010). Microanalytic studies are needed to develop methodologies that could estimate the disaster's loss more accurately.

It could be difficult to define a unanimous term of "indirect loss" as its composition is highly depends on the purpose of the indirect loss estimation. Different agents such as insurance company, government agencies, and health or international aid providers need specific information. Thereby, the estimation of any disaster indirect loss should begin by determining the purpose of the estimation. To measure the impact of indirect loss to local community due the business interruption as a result of disaster, the economist needs to find out the networking or supply-chain of the studied industry (see studies conducted by Henriet & Hallegatte, 2008; Hallegatte & Przyluski, 2010). In brief, it is vital to estimate the impact created by the drop in tourists' expenditure on the decrease in output production, labour wages, and tax payments in the primary and secondary industries.

Assessment methodologies of disaster impact on indirect loss

In general, most researchers use (1) econometric models (Noy & Nualsri, 2007; Skidmore & Toya, 2002; Strobl, 2010); (2) Input-Output (I-O) model (Chen et al. 2014; Hallegatte et al. 2011; Henriet et al. 2012; Li et al. 2013; Ranger et al. 2011; Yoshifumi & Toshitaka, 2006); and (3) computable general equilibrium (CGE) model (Bosello et al. 2012; Carrera et al. 2015; Jonkhoff, 2009; Pauw et al. 2011; Tsuchiya et al. 2007). Econometric models can be employed to measure the long term economic impact that involves large-scale units of analysis (Hallegatte & Przyluski, 2010) such as increased trade indebtedness, balance of trade deficits, and inflation to a nation (Anderson, 1990).

I-O model is popularly used by many researchers in disasters such as large-scale weather-related studies (such as hurricanes) because the model can compute the economic loss caused by the loss of (1) flows of each industry's input to every other industry in the production of a dollar's worth of output within the studied region's economy; and (2) proportions of sales that can be used to pay wages and taxes, and kept by the proprietors as income (Chen et al. 2014; Li et al. 2013; Ritchie & Dowlatabadi, 2014; Toyoda, 2008). I-O model is a flexible methodology and with careful modifications, could be a reliable tool in assessing the indirect loss of an impacted area (Briassoulis, 1991).

CGE embeds the concept of the I-O model, and an added advantage of a CGE model is its ability to estimate the 'interactive effects' between tourism and non-tourism sectors (Ivanov & Webster, 2007). Despite the strengths of CGE model as an analytical and forecasting tool in estimating the change in GDP, employment, and exports of an economy (Ivanov & Webster, 2007), the data are likely to include expenditure of people who reside both within and outside the study area. Moreover, the models' data do not exclude the payments that are not accrued to the local community such as payments to producers located outside the study region. The results of CGE are useful to estimate the indirect loss to the national economy but their level of aggregation could not reflect the indirect loss borne by a specific industry in a smaller region (Zhang et al. 2009).

Comparatively, the I-O model has an added advantage in tracking the impacts of particular travel market segments due to a change of tourism expenditure in a smaller region (Fletcher, 1989). Therefore, I-O modelling is a suitable analytical technique for this study. Researchers have been debating on the relative applicability of discussed models in measuring the disaster economic impact on tourism. However, to choose an appropriate methodology, researchers should start by defining the problems and identifying the economic losses that need to be faced by the respective affected communities; rather than evaluating the sophisticated results than can be produced by each methodology.

THE CONCEPTUAL FRAMEWORK OF I-O MODEL

The disaster affected region and industrial structure

For the study's I-O table, the tourism sector can be separated into the following major spending categories: lodging, domestic transportation, recreations and entertainments, foods and beverages, shopping, and other tourism related sectors such as travel and tours arrangement, ticketing and communication (Domestic Tourism Survey Malaysia, 2013). Other production sectors in the affected region may include the following sectors: agricultural, forestry and fishery, and manufacturing. Each column matrix of the I-O table shows the estimates of input purchases from productive sectors and value added sources located inside and outside the study's region by a particular productive sector. Each row matrix of the I-O table, on the other hand, denotes the estimates of output sales from a

Table 1: Proposed research model

Buy from sector *i* / Sales to sector *j*	Intermediate Demand Productive Sectors								Final Demand Sectors: Export	
	1	2	3	4	5	6	7	8		
1	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}	X_{18}	E_1	X_1
2	X_{21}	X_{22}	X_{23}	X_{24}	X_{25}	X_{26}	X_{27}	X_{28}	E_2	X_2
3	X_{31}	X_{32}	X_{33}	X_{34}	X_{35}	X_{36}	X_{37}	X_{38}	E_3	X_3
4	X_{41}	X_{42}	X_{43}	X_{44}	X_{45}	X_{46}	X_{47}	X_{48}	E_4	X_4
5	X_{51}	X_{52}	X_{53}	X_{54}	X_{55}	X_{56}	X_{57}	X_{58}	E_5	X_5
6	X_{61}	X_{62}	X_{63}	X_{64}	X_{65}	X_{66}	X_{67}	X_{68}	E_6	X_6
7	X_{71}	X_{72}	X_{73}	X_{74}	X_{75}	X_{76}	X_{77}	X_{78}		
8	X_{81}	X_{82}	X_{83}	X_{84}	X_{85}	X_{86}	X_{87}	X_{88}		
Primary inputs										
Wages	W_1	W_2	W_3	W_4	W_5	W_6	W_7	W_8		
Profit	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8		
Rent	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8		
Taxes	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8		
Imports	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8		
Total Inputs (purchase)	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8		

Where

X : Output
W : Wages & salaries
P : Profits & dividends
R : Rent & interests
T : Taxes
M : Imports

FINAL DEMAND SECTORS
E: Exports (visitors' expenditure)

The breakdowns of activities provided by each productive sector are:
1. Lodging sector – hotels, apartments, and homestays.
2. Restaurants, food courts, and street food providers
3. Local transportation –public and private transpiration companies.
4. Amusement parks and leisure centres.
5. Shopping outlets – retail / warehouse / individual shops that sell imported and local products.
6. Miscellaneous – travel and tours arrangement, ticketing and communication.
7. Agricultural, forestry, and fishery
8. Manufacturing

particular productive sector to the same and/or other productive sectors and export (see Table 1). Tourists' expenditure on goods and services produced by each tourism sector is depicted in the export matrix because it represents the flow of new money into the local economy (Hjerpe & Kim, 2007; Fletcher, 1989).

Reconciliation of total sales and purchases estimates for each productive sector in I-O table

In developing countries such as Malaysia, I-O table is constructed to depict the inflow and outflow of national goods and services with other countries. Regional I-O table is not available, especially in smaller regions. Researchers could construct their own I-O table by collecting primary data. The tourism business operators can estimate their expenditure more accurately if their spending components are itemized within major categories that are exhaustive and mutually exclusive. If their business transactions are recorded in complete detail, then an error-free I-O table is probably possible, where the total estimate for sales (X_i) and purchases (X_j) for the same productive sector would show the same amount. However, such perfect recording hardly exist, so both estimates need to be reconciled.

To reconcile the dual estimates, Bourque and Conway suggest that experts of each I-O sector meet and decide on a single most reasonable estimate for each cell value by judging the quality of collected data (cited in Shaffer, 1989). Nevertheless, such approach is criticized in the literature by Gerking (1979), Jensen and McGaurr (1976), Sajal Lahiri (1984), and Shaffer (1989) because the derivation of the final estimate is very much dependent on the analysts' knowledge of the data sources and how the data is collected.

In the 1970s, Jensen and McGaurr (henceforth J-M) recommended the application of "reliability quotients" to the dual estimates of each cell. Biproportional matrix reduction is used to adjust the entire transactions in the I-O table to conform to each sector's total inputs and outputs. In the 1980s, Sajal Lahiri (henceforth SL) proposed to refine the J-M method by giving weights to sales and purchases estimates and in the meantime, reduce the deviation of the summation of both estimates for each sector. In this way, the time costs can be reduced. SL (1984) agreed to the use of subjective judgments too, but stated that the reconciliation procedure has to be flexible enough to accommodate the subjective judgments. Shaffer (1989) asserted that J-M method could enable analysts to reconcile their I-O data more scientifically because the determination of the reliability quotients' score must be done by obtaining responses from relevant industry experts and consistent with the structure of I-O table. In this way, personally subjective judgement could be minimised (Shaffer, 1989). Another reconciliation method: Cross-Hauling Adjusted Regionalization Method (CHARM) (Kronenberg, 2009) was recommended for the reconciliation of non-survey data.

But the question is: Which reconciliation method should be used to reconcile the survey data? According to Miernyk (1976) (cited in Jensen & McGaurr, 1976), "There is no way to statistically test the significance of the difference between the two sets of multipliers" (p.49) because it is difficult to justify the precise amount of input purchases and output sales activated by each tourism sector. The researcher's decision therefore is highly dependent on the analyst's opinion of the reliability of both collected sales and purchase estimates.

Building the I-O Model and Value of Information

After reconciling the data, I-O table needs to be transformed into an I-O model (see the data sample shown in Table 2) to compute the technical coefficients matrix aij by dividing the cell matrix (xij) of each productive sector with the corresponding column matrix (Xj) to measure the proportion of inputs that must be purchased by each industry j from industry i to produce one unit of output (Dietzenbacher, 2002,). The coefficient matrix represents the direct effect of disaster on the local economy. Basically, Table 2 highlights the following important findings. For every MYR1 loss of sales from tourists, the suppliers of the shopping sector will lose MYR0.9415. The workers will lose only 0.56% of its wages. Based on the sample's technical coefficient scores, only a marginal portion of the additional income earned from tourists is distributed to labour. Perhaps, this is because most of the tourism businesses are small entrepreneurial firms consisting of one or two workers. It may also be apparent that the tourism sectors in the study region do not have much co-operation or networking. There is a need to conduct further investigation to explain the causes of such result.

Table 2: Conversion to technical coefficient matrix): *aij = xij* / X*j* : A sample

Sales to Buy from	1	2	3	4	5	6	7	8
1	0.0000	0.0007	0.0000	0.0006	0.0001	0.0018	0.0914	0.0088
2	0.0002	0.0000	0.0000	0.0003	0.0005	0.0009	0.3065	0.0063
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
4	0.0005	0.0010	0.0002	0.8384	0.0002	0.0000	0.2003	0.0565
5	0.0001	0.0021	0.0004	0.0003	0.9415	0.2707	0.0000	0.0063
6	0.0001	0.0001	0.0000	0.0000	0.0097	0.0000	0.0000	0.0001
7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0381	0.0001
8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Intermediate Input	0.0008	0.0040	0.0006	0.8396	0.9521	0.2734	0.6363	0.0783
Wage	0.0773	0.1008	0.3202	0.0233	0.0056	0.5028	0.0636	0.1006
Profit	0.7654	0.5531	0.3336	0.0936	0.0096	0.1814	0.0898	0.6010
Rent	0.0810	0.2151	0.2001	0.0237	0.0172	0.0365	0.1223	0.1456
Import	0.0746	0.1114	0.1176	0.0066	0.0153	-	0.0802	0.0655
Taxes	0.0009	0.0157	0.0278	0.0132	0.0002	0.0058	0.0078	0.0090
Total input	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Notes: values above denote the technical coefficients for the relevant productive sector and primary input
where

1. Lodging sector
2. Food & beverage sector
3. Local transportation sector
4. Recreation & entertainment sector
5. Shopping sector
6. Other tourism related sector
7. Agricultural, forestry, and fishery sector
8. Manufacturing sector

I-O multipliers are computed to measure the indirect effects created by tourism operators' spending within the local economy. To compute the multipliers, it is necessary to transform the technical coefficients into Leontief inverse matrix (Archer & Fletcher, 1996),

$$\Delta X = A\,\Delta X + \Delta T \quad (1)$$

$$\Delta P = B\,\Delta X \quad (2)$$

$$\Delta L = E\,\Delta X \quad (3)$$

where

ΔX = *n x 1* vector of the change in gross output

ΔP = *k x 1* vector of the change in primary factor input

ΔL = *1 x 1* vector of the change in employment resulting from the change in gross output

ΔT = *n x 1* vector of the change in visitor expenditure by category

A = *n x n* matrix of intermediate consumption coefficient

B = *k x n* matrix of coefficients representing usage of primary factors

E = *1 x n* matrix of employment coefficients

Then, solve the equations above,

From (1) $\Delta X\ (I - A) = \Delta T$

Thus, $$\Delta X = (I - A)^{-1}\ \Delta T \qquad (4)$$

Substitute of equation (4) into equations (2) and (3) gives

$$\Delta P = B\ (I - A)^{-1}\ \Delta T \qquad (5)$$

$$\Delta L = E\ (I - A)^{-1}\ \Delta T \qquad (6)$$

The inverse of technology matrix $[(I - A)^{-1}]$ represents the multiplier matrix, also known as Leontief inverse, that can be used to compute the direct and indirect impact of disaster in the local economy. Table 3 discloses that if the lodging sector (sector 1) is losing MYR1 (Malaysian Ringgit) for the purchase of overnight service, the output sales of lodging sector or direct effect will be reduced by MYR1. Indirectly, other sectors such as food operators (sector 2) will lose further sales of MYR0.0001, while recreation and entertainment sector (sector 4) would lose MYR0.0029, and so forth for other sectors – see the column matrix for the lodging sector or sector 1.

Table 3: Sample of Leontief Inverse matrix (I - A) -1 or multipliers and computation of sales multiplier for each sector

Buy from \ Sales to	1	2	3	4	5	6	7	8
1	1.0000	0.0006	0.0000	0.0000	0.0017	0.0022	0.0002	0.0013
2	0.0001	1.0000	0.0000	0.0000	0.0096	0.0035	0.0002	0.0001
3	0.0000	0.0000	1.0000	0.0001	0.0008	0.0002	0.0000	0.0003
4	0.0029	0.0061	0.0011	6.1896	0.0275	0.0075	0.0000	0.0001
5	0.0018	0.0388	0.0080	0.0334	17.8962	4.8445	0.0015	0.0006
6	0.0001	0.0005	0.0001	0.0003	0.1741	1.0471	0.0001	0.0001
7	0.0002	0.0005	0.0000	0.0038	0.0000	0.0002	1.0002	1.0000
8	0.0001	0.0001	0.0000	0.0016	0.0000	0.0000	0.0000	0.0000
Sales multiplier	1.0052	1.0466	1.0092	6.2288	18.1099	5.9052	1.0022	1.0025

The *sales or output multiplier* for each industry can be obtained by summing down the Leontief inverse matrix of each sector *j* (see Table 3). Table 3 shows that when a tourist spend MYR1 less on shopping items (sector 5), the local economy's sales output will be decreased by MYR18.11. The shopping sector itself needs to absorb the loss of MYR1 form direct effect and MYR16.89 from indirect effect. In other words, if tourists are less likely to visit and spend in the destination after a disaster, the shopping business in the disaster and adjacent areas will need to bear the highest loss.

In the meantime (see Table 4), the shopping establishment (sector 5) is also importing MYR0.278 of its input from suppliers located outside the region. People may argue that shopping sector has the highest import multiplier effect and therefore policy makers should be less considerate in reviving the shopping sector. However, tourism interests can convince the public and private decision-makers to allocate more resources for the recovery of this sector if its employment multiplier is high.

Table 4: Sample of import multiplier value for each sector

Buy from \ Sales to	1	2	3	4	5	6	7	8
1	0.075	0.001	$1x10^{-5}$	0.001	0.001	0.001	$1x10^{-4}$	$2x10^{-4}$
2	$1x10^{-4}$	0.111	$1x10^{-5}$	0.001	0.001	0.001	0.0021	$3x10^{-5}$
3	1x10-7	$1x10^{-6}$	0.118	$1x10^{-4}$	0.001	$3x10^{-4}$	$1x10^{-7}$	$1x10^{-5}$
4	$1x10^{-4}$	$4x10^{-4}$	$1x10^{-4}$	0.041	0.001	$5x10^{-5}$	$1x10^{-7}$	$1x10^{-6}$
5	$2x10^{-4}$	0.001	0.001	0.001	0.274	0.074	$2x10^{-5}$	$1x10^{-5}$
6	$3x10^{-5}$	$2x10^{-6}$	$1x10^{-7}$	$2x10^{-6}$	$2x10^{-7}$	$2x10^{-7}$	$1x10^{-7}$	$1x10^{-7}$
7	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-7}$	$2x10^{-5}$	$1x10^{-7}$	$1x10^{-7}$	$2x10^{-5}$	$1x10^{-7}$
8	$1x10^{-6}$	$1x10^{-7}$	$1x10^{-6}$	$1x10^{-6}$	$1x10^{-7}$	$1x10^{-7}$	$1x10^{-7}$	0.112
Import multiplier	0.075	0.113	0.119	0.043	0.278	0.076	0.002	0.113

Employment multiplier is estimated by using the following formula:

$$\Delta L = l\,(I-A)^{-1}\,di \qquad (7)$$

where ΔL is representing the change of labour demand while l is the coefficient vector of the labour. $(I - A)^{-1}$ is referring to the multiplier matrix and di shows the change of visitors' expenditure for sector i. Readers may be interested to know how many additional jobs can be created (or lost) if the final demand for a sector *i* has increased (or dropped) by one unit. Let's illustrate with the following example of the steps that have to be undertaken in computing the employment multiplier. Suppose the technical coefficients matrix for a study is reflected in Table 5.

Table 5: A sample of technical coefficients for the computation of employment multiplier

	Buying sector (*j*)		
Selling sector (*i*)	Shopping	Lodging	Entertainment
Shopping	0.2	0.4	0.1
Lodging	0.3	0.2	0.5
Entertainment	0.2	0.2	0.2
Total	0.7	0.8	0.8
Employees	0.25	0.3	0.3

Please note that the labour vector (*l*) for the above-mentioned example is (0.25 0.3 0.3). Suppose the Leontief inverse matrix is given as follows,

$$\begin{pmatrix} 2.01 & 1.10 & 0.94 \\ 0.90 & 1.72 & 0.97 \\ 0.76 & 0.69 & 1.59 \end{pmatrix}$$

Then, the change of labour's demand for the first sector due to the decrease of one unit of final demand for the first sector's output can be calculated as below,

$$\Delta L = l\,(1\text{-}A)^{-1}\,d i \quad = \quad (0.25 \;\; 0.3 \;\; 0.3) \begin{pmatrix} 2.01 & 1.10 & 0.94 \\ 0.90 & 1.72 & 0.97 \\ 0.76 & 0.69 & 1.59 \end{pmatrix} \begin{pmatrix} -1 \\ 0 \\ 0 \end{pmatrix}$$

$$= \; (0.25 \;\; 0.3 \;\; 0.3) \begin{pmatrix} 2.01 \\ 0.90 \\ 0.76 \end{pmatrix} \quad = \quad [-0.5 - 0.27 - 0.23]$$

By referring to the labour vector (l), we will note that the technical coefficient of labour for the shopping sector is 0.25; this means that when the final demand for the shopping products drops by one unit, the value of employment in this sector will experience a 0.25 direct drop and a further 0.25 indirect decrease. In the meantime, the employment value will experience a 0.27 and 0.23 indirect drops in lodging and entertainment sectors respectively. Employment multiplier of four [(0.25 + 0.25 + 0.27 + 0.23) / 0.25] shows that for every one job lost due to the immediate drop in the final demand of shopping products, three jobs will be lost indirectly.

IMPACTS ON SOCIETY, ECONOMY AND NATION/ POLICY IMPLICATIONS

The economic benefit of visitors' expenditure is a major reason for soliciting the government's effort to revive a disaster impacted tourism destination. There are a number of ways by which the study findings can help improve government policy decisions with regards to tourism marketing and economic restoration. It would be more beneficial to develop the tourism sectors that have high sales multiplier impact, if the government intends to improve the local community's economic income. An alternative way is to revive sectors that were allocating higher proportions of their output sales for wages. On the other hand, developing sectors that scored high employment multiplier impact will be useful if the region has high unemployment. The final decision is determined by the region's economic policy. If the intersectoral linkages between tourism sectors are low, the local government should consider broadening the tourist attractions or diversifying tourism businesses. Such improvements can entice more tourist arrivals and expenditure in the studied area. Encouraging the local businesses to use more local inputs – such as crafts, cooking ingredients and local labour – can help make the local economy more self-sufficient. In this way, more tourism related small businesses can also be established.

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