



# Effect of tourism on environmental pollution: Further evidence from Malaysia, Singapore and Thailand

Muhammad Azam PhD Economics <sup>a, \*</sup>, Md Mahmudul Alam <sup>b</sup>,  
Muhammad Haroon Hafeez <sup>c</sup>

<sup>a</sup> Department of Economics, Abdul Wali Khan University Mardan, 23200, KP, Pakistan

<sup>b</sup> School of Economics, Finance & Banking, College of Business, Universiti Utara Malaysia, 06010 UUM Sintok, Kedah, Malaysia

<sup>c</sup> Institute of Management Sciences (Business Administration), Bahauddin Zakariya University, Multan Pakistan

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## ABSTRACT

An increasing number of studies reveal that tourism industry makes a substantial contribution towards socioeconomic growth and development of tourism led economies. However, tourism steered economic growth and development is achieved at the cost of environmental pollution and degradation. The main objective of this study is to examine the effect of tourists' arrivals on environmental pollution caused by Carbon Dioxide emissions in Malaysia, Thailand and Singapore over the period of 1990–2014. Some other regressors namely energy consumption and income are also used in the multivariate model. The Zivot–Andrews test is employed to determine unit-root and presence of structural break in the data. Fully Modified Ordinary Least Squares estimator is used as an analytical technique for unknown parameters estimation. The empirical results reveal that tourism has a significant positive effect on environmental pollution in Malaysia. However, an inverse relationship between tourism and environmental pollution is observed in Thailand and Singapore. Empirical findings suggest that sustainable economic growth and development should be ensured by implementing prudent public policy where host governments must strive to promote socially and environmentally responsible tourism industries in their respective countries.

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## 1. Introduction

Tourism contributes enormously towards the economic development of host countries. Globally, many developing countries rely largely on tourists' spending which accounts for significant contribution to Gross Domestic Product (GDP) of those countries. According to Ashley et al. (2007) tourism contributes almost 40% of GDP in developing economies and approximately 70% of GDP in case of very small island economies. However, with reference to developed and more diversified economies, tourism accounts for 2%–12% share in GDP. Moreover, according to most recent report by World Tourism and Travel Council (WTTC) approximately 1.2 billion tourists travelled internationally in 2015; thus, tourism industry contributed US\$ 7.2 trillion i.e. 9.8% of world's GDP and generated 284 million jobs i.e. 9.5% of total employment

\* Corresponding author.

E-mail addresses: [drizam75@yahoo.com](mailto:drizam75@yahoo.com) (M. Azam), [mahmudul@uum.edu.my](mailto:mahmudul@uum.edu.my) (M. Mahmudul Alam), [haroonhafeez81@gmail.com](mailto:haroonhafeez81@gmail.com) (M. Haroon Hafeez).

opportunities globally (WTTC, 2016a). These figures reflect the substantial role of tourism in global economy. Tourism influences the economy of host countries in multiple ways; through employment generation, infrastructure establishment, tourism-related value chain development and through other socio-economic impacts on the lives of domestic population Tang and Abosedra, 2014; Tang and Tan, 2013; Apergis and Tang, 2013; Ashley et al., 2007).

However, the other side of the picture is quite dismal and gloomy. On one hand, tourism industry serves as a catalyst for economic growth of tourism led economies; whereas, the flip side of coin illustrates that there are numerous hazardous effects of rapidly increasing tourism. Some of those hazards are economic (uneven development, income inequality, geopolitical risks, rising costs of materials); whereas, others are environmental (extreme weather conditions and climate change, emission of greenhouse gases, water and other resources scarcity, excess consumption of energy) and social (child labour and forced labour, human trafficking and sex tourism, culture and heritage protection) in nature (Mowforth & Munt, 2016; WTTC, 2015). It is immensely

apprehended that positive aspects of tourism would be overshadowed by the aforementioned negative aspects if serious efforts are not made towards promoting socio-economically viable and environmentally sustainable tourism worldwide. Tourism has been attributed as an environmentally damaging industry on account of the greenhouse gas discharges related with tourist mobility (Higham et al. (2016). Wang et al. (2018) expounds that being one of the key CO<sub>2</sub> emitter, industrial sector has drawn substantial attention of the global community regarding efficient energy usage and CO<sub>2</sub> reduction policies.

Irrespective of tremendous contribution of Travel and Tourism (T&T) industry to the economic progress, it is still an uphill task for the industry to maintain a positive outlook in terms of its expansion and growth. With the promulgation of Islamic and medical tourism as its backbone, Malaysian government has rendered its undoubted devotion to strengthen and support the tourism industry. However, Blanke & Chiesa (2013) observed Malaysia's challenging situation to cope with the growth momentum when the T&T sector declined two points in the global index of T&T competitiveness among 140 countries in 2013, from the 32nd place in 2008, as mentioned in the Travel and Tourism Competitiveness (T&TC) Report 2013. This decline happened quite unexpectedly and without any indications; however, the industry managed to learn some alternative methods to carry out tourism business more successfully. With particular focus on quality and environmental dimensions, several basic initiatives can be taken in this regard. More recently, analytical reports and newspapers identified some factors i.e. travelling, hotels, accommodation, and other facilities and services that cause T&T industry to be a significant contributor in global greenhouse gases emissions (Doyle, 2014; UNEP, 2015). Air travelling and accommodation predominantly rely on huge energy consumption (Gossling, 2002; Tovar and Lockwood, 2008; Gossling et al., 2010), which consequently leads to greenhouse gases emissions, particularly CO<sub>2</sub> (see Becken et al., 2003; Becken, 2005; Liu et al., 2011; Katircioglu, 2014a; Solarin, 2014). This becomes more relevant in case of Malaysia where its position in terms of environmental management ranking eventually declined and the environmental sustainability rating deteriorated to 61 from 44 in 2008, as revealed in 2013 in the updated version of the T&TC report (Blanke and Chiesa, 2013). This decline was further supported when Malaysia was ranked at 103 in 2013, dropping from 86th position in 2008 with regard to CO<sub>2</sub> emissions (Blanke and Chiesa, 2013). It must be remembered that environmental quality degeneration can't be treated as an insignificant matter any further, as poor air quality would subsequently obstruct travel demand and upcoming progress opportunities (Kelly and Williams, 2007; Pang et al., 2013). Finally, the countries in pursuit of their developmental objectives are deemed to have incurred additional costs caused by rapidly emerging environmental consequences and climate change (Shahbaz et al., 2015).

Likewise, tourism industry provides tremendous support to socio-economic development of Thailand. In 2015, travel and tourism industry contributed THB 2795.1 billion which represents 20.8% share in GDP. Besides, travel and tourism industry created almost 6 million direct and indirect employment opportunities which account for 15.4% of total employment opportunities in Thailand. Similarly, with reference to Singapore, the role of travel and tourism industry in economic development is quite significant. In 2015, travel and tourism industry contributed SGD 39.5 billion which represents 10% share in GDP. Moreover, travel and tourism industry generated almost 310,500 direct and indirect employment opportunities which account for 8.5% of total employment opportunities in Singapore. In 2015, the total investment in travel and tourism industry of Singapore was SGD 19.8 billion which represents 19.9% of total investment in Singaporean economy (WTTC,

2016c).

According to Wilson (1994) tourism being the most prominent industry of Singapore is also considered as one of the largest industries of Asia Pacific region. Keeping in view the economic context, Katircioglu (2014b) authenticates that hypothetical relationship between tourism and growth is immensely important because locomotive sector serves as a pillar of Singapore economy. In this regard, Chang and Wong (2003) examined the linkage of oil price shocks with the economic scenario of Singapore, which has significant implications for energy sector. The findings revealed that oil price shock has a very minimal impact on Singapore economy, irrespective of Singapore's status as net oil importer. Xuchao et al. (2010) carried out an analytical research regarding energy consumption and CO<sub>2</sub> emissions mainly caused by hotel industry in Singapore. A well-established and feedback relationship between electricity consumption and economic development in Singapore is found to have been established by Yoo (2006) as well. On the contrary, Karki et al. (2005) have advocated that economy of the Association of South East Asian Nations is prospering at surprisingly dynamic rate, in terms of rapidly increasing urbanization, diversified energy resources and technology oriented industrialization.

The focus of this study is on socio-economic significance of tourism and its impact on environmental pollution in tourism-led economies in Southeast Asia namely Malaysia, Thailand and Singapore. The T&T industry of Malaysia has experienced rapidly increasing growth over the previous few decades owing to the focused governmental endeavours and intensive campaigning to declare Malaysia as tourists' favourite destination (Ng et al., 2016). T&T plays a significantly crucial role in the Malaysian economy in terms of economic growth which is clearly represented by constant improvement in the rankings according to the contribution to the national economy in 2013. T&T contributed RM 1.5 billion to the Gross National Income (GNI) that reached up to 16.1% of GDP in 2013 (Tourism Malaysia, 2014). In 2015, T&T industry contributed MYR 152.8 billion which represents 13.1% share in GDP. In addition, T&T industry created almost 1.5 million direct and indirect employment opportunities which account for 11.4% of total employment opportunities in Malaysia. In 2015, the total amount injected in travel and tourism industry of Malaysia was approximately MYR 20.7 billion which represents 6.9% of total investment in Malaysian economy (WTTC, 2016b).

Keeping in view the previous research, the countries under study namely Malaysia, Thailand, and Singapore are emerging economies with constantly increasing number of tourists. Consequently, environmental pollution in the form of CO<sub>2</sub> emission has also maintained an upward trend. The main issue is to identify the actual trigger of this upsurge in CO<sub>2</sub> emission, be it tourism or some other factors. Therefore, a fresh quantitative study is required in order to examine the relationship between tourism and environment.

Indeed, the very constructive role played by the tourism sector can't be overlooked in the process of economic growth and development and thereby promoting social welfare. At the same time, the environment and economic growth has a close relationship, where clean and green environment is necessary for improving social wellbeing. Therefore, the broad objective of this study is to explore the impact of tourism on environmental pollution by CO<sub>2</sub> emissions<sup>1</sup> in Malaysia, Singapore and Thailand during the period ranging from 1990 to 2014. The foremost rationale behind selection

<sup>1</sup> Following the studies of Acharyya (2009), Azam (2016) and Zheng and Sheng (2017), where they also measured environmental pollution/degradation by CO<sub>2</sub> emissions.

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