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Green Growth and Sustainability: The Role of Tourism, Travel and Hospitality Service Industry in Korea

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Abstract

Purpose - The study investigates the influence of tourism and hospitality industry on economic growth and CO2 emissions.

Research design, data, and methodology - In the empirical analysis, unit root tests, cointegration test and vector error correction model regression using time series data of South Korea from the first quarter of 1970 to the third quarter of 2010 are performed to examine the long-run equilibrium relationship and short-run dynamics among the tourism and hospitality industry, CO2 emissions, economic growth and other industry sectors.

Results - Results indicate that a long-run equilibrium relationship exists among these variables. Furthermore, the tourism and hospitality industry and CO2 emissions have high significant positive effect on economic growth. The tourism and hospitality industry in Korea, in turns, shows a high significant positive impact on economic growth while the industry sector incursa high significant negative impact on CO2 emissions.

Conclusions - The tourism and hospitality industry in Korea may havebeen prompted by several factors such as accelerated process of technological innovation or energy and environmental policies. These findings suggest that the effectively managed tourism and hospitality sector in Korea has resulted in both economic growth and a reduction in CO2 emissions.

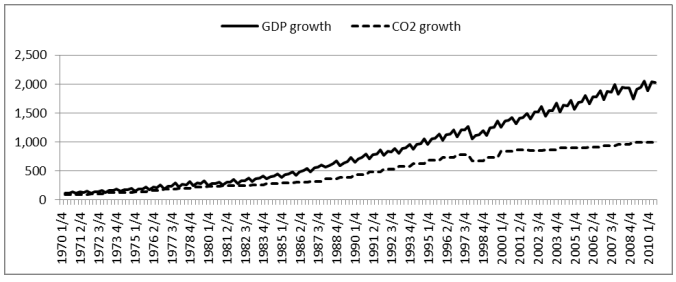
Keywords : tourism; hospitality; economic growth; carbon emissions; Korea

JEL Classifications : O41, O44, Q55, Q56, Q58

1. Introduction

When an economy opens up to the rest of the world it gets the opportunity to specialize in specific areas, in which they have a competitive advantage. This arrangement has salutary consequences for the value of output produced. The question is here what the consequences are for economic, social and environmental sustainability – that is, whether economic, social and environmental indicators improve over time in a sustainable manner along with growth in the economy. Since the early 1970s, South Korea has achieved a remarkable record of economic growth and integration into the high-tech and knowledge based world economy. A competitive education system, a highly skilled and motivated workforce, and an advancement of information communications technology might be most important key factors driving this economy. In recent years, however, many economists concern that South Korea's economic growth potential has fallen because of international pressure for environmental sustainability initiative and industry structural problems that are becoming increasingly apparent.

Carbon dioxide (CO2) emissions are those stemming mainly from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring. A recent annual publication of the Carbon Dioxide Information Analysis Center (Boden et al., 2011) reports that South Korea experienced phenomenal growth in fossil-fuel CO2 emissions with a growth rate that averaged 11.5% annually during 1970-2010 (Figure 1).



Note: Historically, from 1970 until 2010, South Korea's average quarterly GDP growth was 1.78 percent reaching an historical high of 6.80 percent in March of 1988 and a record low of -7.00 percent in March of 1998. This figure displays quarterly GDP growth rate and CO2 emissions growth rate (which measures growth over the base of 100, that of 1st quarter of 1970) of Korea.

<Figure 1> Growth Ratio of GDP and CO2 Emissions from Korea

Initial growth in CO2 emissions was due to coal consumption, which still accounts for 46.9% of South Korea's fossil-fuel CO2 emis-

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sions; since the early 1970s oil consumption has been a major source of emissions. South Korea is the world's fifth largest importer of crude oil. According to the International Energy Agency (2011), South Korea ranked as the world's ninth largest CO2 emitter with 488.7 million metric tons of CO2 in 2007. South Korea's CO2 emissions grew 113 percent between 1990 and 2010 – the largest growth among the 30 member nations of the Organisation for Economic Cooperation and Development, while global CO2 emissions grew 38 percent during the same period. All these data are likely to put greater pressure on South Korea, which is currently bidding to become an emerging leader in the global quest to reduce greenhouse gas emissions.

Despite many stakeholders' efforts to reduce greenhouse gas emissions while continued economic growth, there exists a big division throughout industries between rapid following and moderate following industries. However, environmental problems have known no industry boundaries. The challenge facing South Koreais how to develop policy responses to counter the effects of the current environmental problems and lay the foundations for robust and sustainable growth that generate employment and at the same time reduces CO2 emissions from industries. These policies may be different from those pursued in the past as they not only have to lead to high growth rates but must also lead to sustained employment generation as well as structural changes in Korean industries. In this regard, the increased economic importance of international tourism and hospitality industry raises new questions for the government regarding best policy frameworks to encourage continued economic growth and reduction of CO2 emissions. The rapid growth of tourism and hospitality industry in the past decade also introduces new policy issues for consideration, such as the effect of tourism on environmental sustainability, effective use of natural resources and the influence of tourism and hospitality industry on economic productions.

Does the development of tourism and hospitality industry cause an increase in CO2 emissions? It can bea vital question to explicitly disentangle the effect of tourism and hospitality industry development on both environmental sustainability and economic growth. This study aims to answer the following two questions: First, is there a long-run equilibrium relationship between the tourism and hospitality industry, environmental sustainability and economic growth? Second, what is the direction of causality among the tourism and hospitality industry, CO2 emissions and economic growth in the short-run? This study employs cointegration tests to investigate a long-run equilibrium and Granger causality tests to investigate directional causality in the short-run.

2. Literature Review

2.1. Tourism and Economic Growth

In the 20th century, the globalization of capitalism, movement of population, and advances in transportation and communication technology helped to develop the tourism and hospitality industry into one of the world's largest industries. Because of its ability to create income, taxes, hard currency and jobs, the tourism and hospitality industry has made a significant contribution to the economy of many communities around the world (World Travel and Tourism Council, 2004; Choi & Sirakaya, 2006; Dwyer & Forsyth, 2008). Anticipated economic benefits from the tourism and hospitality industry can encourage the building of poorly planned infrastructure, particularly in developing countries. Many empirical studies present strong evidence of a positive relationship between tourism and economic growth in developing countries. For example, Fayissa et al.(2008) report tourism positively affects economic growth and development in most of the sub-Saharan African countries; Khalil et al.(2007) also report tourism has a positive impact on economic development in Pakistan; Carrera, Brida and Risso (2007) report tourism development impacts on economic growth in Mexico in the long-run.

Many empirical studies present strong evidence of a positive relationship between tourism and economic growth even in industrialized countries. For example, Lee (2008) reported tourism has a positive impact on economic growth in Singapore; Chen and Chiou-Wei (2009) reported tourism has a significant impact on economic growth in Taiwan; Balaguer and Cantavella-Jordá (2002) also reported tourism leads economic growth in the Spain economy. Many researchers have proposed a tourism-led economic growth hypothesis that assumes tourism to be a major factor of overall long-run economic growth (Dritsakis, 2004a, b). Gunduz and Hatemi-J (2005) proved the tourism-led economic growth hypothesis for Turkey. They find unidirectional causality running from international tourism to economic growth of the country.

In this regard, Sahli and Nowak (2007) reported that many governments have engaged in tourism development for the purpose of economic development. Mihalic (2002) showed several advantages of tourism as a development strategy compared to the export of goods and services. International tourism receipts are a major source of foreign exchange earnings as well as simply generating export revenues. Tang and Jang (2009) reported that there exists a temporal hierarchy among tourism related industries and the tourism and hospitality industry can ignite the development of other industries and the overall economy (Holzner, 2011; Sequeira & Nunes, 2008). In summary, Lee and Chang (2009) reported that tourism not only stimulates the growth of the industry, but triggers overall economic growth of countries. The results of previous studies seem to be based on the assumption that the activity of tourism and hospitality industry would affect positively the national economy. Accordingly, the following hypothesis is considered:

Hypothesis 1: The tourism and hospitality industry leads to economic growth.

2.2. Economic Growthand CO2 Emissions

Historically there has been a close correlation between economic growth and environmental issues: as the economies grow, so the environment declines (Adams & Jeanrenaud, 2008). This trend is clearly demonstrated on graphs of human population numbers, economic growth, and environmental indicators. While conventional economics is concerned largely with economic growth and the efficient allocation

of resources, ecological economics has the goal of sustainable and fair distribution and efficient allocation, in that order (Costanza et al., 2007; Daly & Farley, 2004). Sustain ability studies analyze ways to reduce the amount of natural resources needed for the production, consumption and disposal of a unit of good or service whether this is achieved from improved economic management or new technology. Economic activity may be a key driver of CO2 emissions. As the economy expands, demand for and supply of energy increases, pushing up CO2 emissions. The large volume of literature on the relationship between sustainable development and environmental issues is introduced (e.g. Swart et al., 2003; Wilbanks, 2003). Much of this literature emphasizes the degree to which climate change mitigation can have effects. The challenge then becomes ensuring that actions taken to address global environmental problems help to address regional and local development (Beg et al., 2002). Achieving low CO2 emission baseline scenarios consistent with other principles of sustainable development would illustrate the significant contribution of sustainable development (Metz et al., 2002; Robinson et al., 2006). By framing the debate as a sustainable development problem rather than as climate change mitigation, the priority goal of all countries is better addressed, while acknowledging that the driving forces for CO2 emissions are linked to the underlying development path (International Panel on Climate Change, 2007).

A well-known hypothesis providing support for a policy that emphasizes economic growth at the expense of environmental problems is the environmental Kuznets curve hypothesis. It posits that countries in the development process will see their levels of environmental problems increase until some income threshold is met and then afterwards decrease. If true, economic policies should allow extensive, although not necessarily absolute, use of the environment for growth purposes. However, carrying out such policies involves inherent dangers. The most pressing danger is that additional environmental problems could cause some irreversible and significant harm. Therefore, the reliability of these estimates has been challenged on technical grounds (Harbaugh et al., 2002; Millimet et al., 2003). They conclude that the relationship between GDP and CO2 emissions is less robust than previously thought. In addition, studies using time series at the country level find less robust relationships between GDP percapita and CO2 emissions per capita. For example, Coondoo and Dinda (2002) find strong correlation between CO2 emissions and income in developed countries, but a weaker correlation in Africa and Asia. Accordingly, the following hypothesis is considered:

Hypothesis 2: Economic growth is positively related to CO2 emissions.

2.3. Tourism Industryand Environmental Issues

Tourism fundamentally involves the transportation and hosting of tourism consumers in a tourism destination, where the tourism product is consumed. For example, car usage has dramatically increased in tourism destinations and this causes many environmental problems (Gössling, 2002; Gössling et al., 2002). Moreover, the tourism and hospitality industry depends on a wide range of infrastructure services i.e. airports, ports, roads, railheads, as well as telecommunications and utilities. The development of tourism and hospitality industry, such as travel, resort development, the construction and use of associated infrastructure, generate a wide range of environmental and ecological impacts. Although the tourism and hospitality industry has brought economic benefits, it has significantly contributed to environmental problems and negative social impacts (Tovar & Lockwood, 2008). These undesirable side effects have led to the growing concern for the conservation of natural resources and the long-term economic viability of communities (Akis et al., 1996; Haralambopoulos & Pizam, 1996; Healy, 1994). Hall (1998) examined rural tourism as a vehicle for sustainable development in South-Eastern Europe and reported that the potential of rural tourism development in the region continues to be constrained by regional instability. Martín-Cejas and Sánchez (2010) reported road transport usage in Lanzarote Island (Spain)and its implications for sustainable tourism development. They used the ecological footprint indicator to determine the environmental impact and reported tourism's inputs such as transport have to be combined in a sustainable way to guarantee its long-term survival.

It is evident that environmental problems are likely to occur as a result of tourism development, for example, construction of hotels and tourist establishments. The effects of global environmental changes are already visible and more dramatic changes, particularly climate changes are predicted (Gössling & Hall, 2006),which are expected to have major impacts on a whole range of tourism destinations, such as mountain regions (Scott, 2006) and coastal and lake areas (Craig-Smith et al., 2006). The tourism and hospitality industry also uses energy for the transport of tourists to and from as well as within destinations. As most of this energy is derived from fossil fuels, energy use in the tourism and hospitality industry is linked to emissions of greenhouse gases. Many researchers argue the issue of tourism related energy consumption and its implications for environmental issues such as its contribution to greenhouse gases (Bode et al., 2003; Scott et al., 2010). A study commissioned by the UNWTO (2008) estimates global tourism-related CO2 emissions at roughly 5% of total global emissions in 2007. Most of these emissions are generated by the transport of tourists and, in particular, air travel. Thus, the contribution of tourism and hospitality industry to climate change is on a global level and substantial.

Of fundamental importance to the future of tourism's contribution to climate change are strong growth trends that characterize the sector. With more trips, accommodation capacity worldwide, and the growing energy intensity of most trips, future CO2 emissions from the tourism sector are expected to increase substantially, even considering current trends in technological energy efficiency gains in transport and in accommodation. In this regard, if tourism remains on a business-as-usual pathway, it will become a key source of CO2 emissions in a world seeking to decarbonize all other sectors of the economy(Scott et al., 2010). Scott (2011) and Weaver (2011) argued that how tourism responds to climate change is critical to the sustainability of tourism and should the sector retreat from climate change engagement, it would be to its substantial detriment. Accordingly, the following hypothesis is considered:

Hypothesis 3: The tourism and hospitality industry is positively related to CO2 emissions.

3. Research Methodology

3.1. Data

The following indicators of economic activities are used.

Gross domestic product at market prices is used as a proxy for economic growth. Tourism is used as a proxy for the economic activity of tourism and hospitality industry. It is the combined output of tourism and hospitality industry, including the output of restaurants and hotels and the output of culture and entertainment services. Manufacturing is used as a proxy for the economic activity of manufacturing industry. It includes productions of food, beverages and tobacco; textiles and leather; petroleum, coal and chemicals; non-metallic mineral products except petroleum and coal; metal, fabricated metal products; machinery equipment; electrical and electronic equipment; transport equipment; and furniture and other manufacturing industries. Construction is used as a proxy for the economic activity of construction industry. It includes construction of residential structures, construction of non-residential structures, civil engineering, and building maintenance. Retailing is used as a proxy for the economic activity of wholesale and retail industry. It includes the output of wholesale trade and the output of retail trade. All these data were obtained from the database of the Bank of Korea Economic Statistics System and reported on a quarter basis from the first quarter of 1970 to the third quarter of 2010 (163 observations).

CO2 is those stemming mainly from the burning of fossil fuels and the manufacture of cement. All emission estimates are expressed in million metric tons of carbon. The data in Table 1 represent on a quarter bases, which were transformed from the annual data reported by International Energy Agency. The time series data are seasonally unadjusted and, therefore, all series were transformed into a natural log that mitigates possible distortions of dynamic properties of the series. Log transformation is a preferred method since each resulting coefficient in the regression equation represents elasticity, which is the ratio of the incremental change of the logarithm of a function with respect to an incremental change of the logarithm of the argument. Table 1 displays descriptive statistics of the time series.

<Table 1> Descriptive Statistics of the Sample Series

Variables	N	Minimum	Maximum	Mean	Std. Deviation
GDP	163	12807.50	262432.60	108306.55	77069.94
CO2	163	13.02	128.87	65.57	39.86
Tourism	163	564.40	8604.90	3582.41	2595.91
Manufacturing	163	1031.40	74343.10	23148.12	20457.37
Construction	163	1123.60	18598.80	9153.46	5345.55
Retailing	163	1305.60	19164.60	9103.27	5606.86

Note: All units are billion Korean won, with the exception of CO2 that are expressed in million metric tons of carbon, and those data are reported quarterly by the Bank of Korea.

3.2. Unit Root Test

It is well known in the literature that the data generating process for many economic variables are characterized by stochastic trends that might result in spurious inference if the time series properties are not carefully investigated. A time series is said to be stationary if the mean and autocovariances of the series do not depend on time. The formal method to test the stationarity of a series is the unit root test. There are several well-known tests for this purpose based on individual time series. They are the augmented Dickey and Fuller (1979), Phillips and Perron (1988), and Ng and Perron (2001) unit root tests. The unit root tests described above test the null hypothesis: a series has a unit root (non-stationary). Kwiatkowski, Phillips, Schmidt and Shin (1992) propose a different approach from the unit root tests described above in that the series is assumed to be stationary under the null.

Table 2 reports the results of unit root tests. All test equations were tested by the method of least squares, including an intercept but no time trend in the model. Probabilities for all tests assume asymptotic normality. The optimal lag in the augmented Dickey-Fuller test is automatically selected based on the Schwarz info criterion and the bandwidth for the Phillips- Perron test is automatically selected based on the Newey-West estimator using the Bartlett kernel function. The null hypothesis of a unit root cannot be rejected in the level of the series, but all null hypothesis of a unit root is rejected in the first difference of the series. The other series of manufacturing, construction, and retailing were also tested by every test method and the results of unit root tests are qualitatively similar. The numeric values of unit root tests for those time series were not reported here due to space problems. The results in Table 2unanimously confirm that all series are integrated of order one I(1).

<Table 2> Results of Unit Root Tests

Variables	GDP(0)	GDP(1)	CO2(0)	CO2(1)	Tourism (0)	Tourism (1)
ADF test	-2.206	-3.576***	-2.413	-4.727***	-1.040	-5.450***
PP test	-2.379	-48.222***	-2.254	-14.564***	-1.185	-26.850***
NP test	3.764	-1.632*	3.830	-5.853***	4.268	-3.158***
KPSS test	1.571***	0.359	1.549***	0.353	1.579***	0.150

Note: Probability values for rejection of the null hypothesis are employed at the 0.05 level (***, p-value < 0.01, **, p-value < 0.05 and *, p-value < 0.1).

3.3. Cointegration Tests

Engle and Granger (1987) point out that a linear combination of two or more non-stationary series may be stationary. If such a stationary linear combination exists, the non-stationary time series are

said to be cointegrated. The stationary linear combination is called the cointegrating equation and may be interpreted as a long-run equilibrium relationship amongthe variables. There are several tools for testing for the presence of cointegrating relationships among non-stationary variables in a multi variate setting. They are the Johansen (1991) cointegration test, and Phillips and Ouliar is (1990) residual based cointegration tests. The Phillips-Ouliaris tests obtain only one single cointegration relationship based on ordinary least squares, whereas it is possible to obtain more than one cointegration relationship with the Johansen test, which is a maximum likelihood based test that requires a large sample. The Johansen procedure uses two ratio tests, a trace test and a maximum eigenvalue test, to test the number of cointegration relationships. Both can be used to determine the number of cointegrating vectors present, although they do not always indicate the same number of cointegrating vectors. If trace statistics and maximum eigenvalue statistics yield different results, the result of the maximum eigenvalue test is preferred because of the benefit of carrying out separate tests on each eigenvalue.

Table 3 displays the results of the Johansen cointegration test. The test equation was tested by the method of least squares. The regression model allows for a linear deterministic trend in data and includes intercept but no trend in vector autoregressive. Table 3reports that the trace statistic and the maximum eigenvalue statistic are larger than the critical values; the null hypothesis of no cointegration is rejected at the 5 % significance level. Trace test indicates two cointegrating equation at the 0.1 level while maximum eigenvalue test indicates one cointegration at the 0.1 level. The results indicate that there exists at least one cointegrating relationship among the variables at the 0.1 level.

<Table 3> Results of Johansen Cointegration Test

Number of cointegration (r)	Trace statistic	Maximum Eigenvalue statistic
r = 0	104.752**	37.498*
r ≤ 1	67.253*	24.599
r ≤ 2	42.654	18.104

Note: The probability value for rejection of the null hypothesis of no cointegration is based on the 0.05 level (***, p-value < 0.01, **, p-value < 0.05, *, p-value < 0.1).

3.4. Vector Error Correction Models

Engle and Granger (1987) report that if two or more variables are cointegrated, there always exists a corresponding error correction representation, in which the short-run dynamics of the variables in the system are influenced by the deviation from equilibrium. The vector error correction model is a technique that facilitates to capture both the dynamic and interdependent relationships of regressors. The vector error correction implies that changes in one variable are a function of the level of disequilibrium in the cointegrating relationship, as well as changes in the other explanatory variables. Therefore, vector error correction models for this study can be constructed as shown in Equation 1 and 2.

$$\Delta \ln GDP_t = \alpha_1 + \sum_{j=1}^{n-1} \beta_{1j} \Delta \ln CO2_{t-j} + \sum_{j=1}^{n-1} \beta_{1j} \Delta \ln TOUR_{t-j} + \sum_{j=1}^{n-1} \beta_{1j} \Delta \ln MFG_{t-j} + \sum_{j=1}^{n-1} \beta_{1j} \Delta \ln CON_{t-j} + \sum_{j=1}^{n-1} \beta_{1j} \Delta \ln RET_{t-j} + \sum_{j=1}^{n-1} \gamma_{1j} \Delta \ln GDP_{t-j} + \theta_1 \mathrm{ECT}_{t-1} + \varepsilon_{1t} \quad (1)$$

$$\Delta \ln CO2_t = \alpha_2 + \sum_{j=1}^{n-1} \beta_{2j} \Delta \ln GDP_{t-j} + \sum_{j=1}^{n-1} \beta_{2j} \Delta \ln TOUR_{t-j} + \sum_{j=1}^{n-1} \beta_{2j} \Delta \ln MFG_{t-j} + \sum_{j=1}^{n-1} \beta_{2j} \Delta \ln CON_{t-j} + \sum_{j=1}^{n-1} \beta_{2j} \Delta \ln RET_{t-j} + \sum_{j=1}^{n-1} \gamma_{2j} \Delta \ln CO2_{t-j} + \theta_2 \mathrm{ECT}_{t-1} + \varepsilon_{2t} \quad (2)$$

Where, Δ is the difference operator; α is the deterministic component; β, γ, and θ are the parameters to be estimated; ε_t is assumed to be stationary random errors with mean zero j is the lag length; t represents 1, 2, 3, ..., n observation; ECT_t is the error correction term obtained from cointegrating vectors.

Table 4 displays the results of Granger causality tests. The regression model allows for a linear deterministic trend in data and includes intercept but no trend in vector autoregressive. Vector error correction models have estimated the coefficients of regressors. Numbers in the cells are coefficient values of regressors. Hypothesis 1, the tourism and hospitality industry leads to economic growth, is supported and statistically significant at the 0.01 level. The result indicates that the tourism and hospitality industry has a positive and significant effect on economic growth of South Korea. For example, a 1 percent increase in the economic output of tourism and hospitality industry increases GDP by 0.495 percent. Hypothesis 2, economic growth leads to an increase in CO2 emissions, is supported and statistically significant at the 0.05 level. The result indicates that economic growth has a positive and significant effect on an increase in CO2 emissions in the short-run. For example, a 1 percent increase in GDP increases CO2 emissions by 0.141 percent. Hypothesis 3, the tourism and hospitality industry leads to an increase in CO2 emissions, is supported and statistically significant at the 0.01 level. The result indicates that the tourism and hospitality industry is in inverse relation to CO2 emissions. For example, a 1 percent increase in the economic output of tourism and hospitality industry reduces CO2 emissions by 0.095 percent.

<Table 4>Results of Vector Error Correction Regression

Variables	Model 1	Model 2
Error correction term	0.106	0.020
GDP		0.141**
CO2	0.288**	
Tourism	0.495***	-0.095***
Manufacturing	-0.137	0.218***
Construction	0.191***	-0.056**
Retailing	0.566***	-0.226***
Adjusted R-squared	0.811	0.383
F-statistic	99.488	15.252

Note: The probability value for rejection of the null hypothesis is employed at the 0.05 level (***, p-value < 0.01, **, p-value < 0.05 and *, p-value < 0.1).

4. Discussion and Policy Implications

A positive effect of the tourism and hospitality industry on economic growth and a negative impact on CO2 emissions suggests that a 1 percent increase in the tourism and hospitality industry increases economic growth by 0.495 percent and reduces CO2 emissions by 0.095 percent. The tourism and hospitality industry in Korea may have been prompted by several other factors such as accelerated process of technological innovation or energy and environmental policies. These findings suggest that the effectively managed tourism and hospitality sector in Korea has resulted in both economic growth and a reduction in CO2 emissions. As such, continued greening the tourism and hospitality sector must bea priority for the economy. In view of this critical importance, it is vital to provide a suitable infrastructure, called a green infrastructure, for greening the tourism and hospitality industry since the tourism and hospitality industry depends on a wide range of infrastructure and infrastructure services such as telecommunications and utilities required by hotels, restaurants, shops and tourist site facilities.

According to the World Travel and Tourism Council report (1999), tourism can be one of the most effective drivers for the development of regional economies. The report says that tourism is able to contribute to development that is economically, ecologically and socially sustainable because it has less impact on natural resources and the environment than most other industries and provides an economic incentive to conserve natural environments and habitats, which might otherwise be allocated to more environmentally damaging land uses. Tourism is one of the many external forces influencing the direction and options for local development. The question of whether tourism can be sustainable, that is, whether it can contribute to sustainable development of local communities, is addressed in the context of the Local Agenda 21 process (International Council on Local Environmental Initiatives, 1999). In this regard, it is needed that a practical discussion on sustainable tourism development must take place in and with the communities that are being influenced.

Although South Korea's rapid economic growth has been a result of an export-led economy, the tourism and hospitality industry may be another contributing factor toward South Korea's recent economic growth while less impact on environmental problems of the economy. According to the tourism research economic data of the World Travel and Tourism Council (2011), the tourism industry in South Korea contributed about US$63.1 billion to GDP, 7.6% of the total economy in 2009. The tourism industry in Korea also supports about 8% of the total employment. Tourism receipts, including expenditures by international tourists on goods and services within the economy, reached US$13.8 billion, which was 23.4% of the total exports of the economy in 2009. International tourists' spending includes both travel spending and spending on transportation as well as hospitality services. This spending takes into account tour, business, education, and diplomat arrivals as well as other arrivals (i.e. visiting friends and relatives, conference convention arrivals, etc.). The Korea Culture and Tourism Institute publishes short-term international arrivals to South Korea on a monthly basis. According to a recent statistic of the institute, total international arrivals into Korea grew 57% from August 2005 to August 2010. According to the institute, those international tourists come primarily from neighboring countries in Asia. Japan, China, Hong Kong and Taiwan together account for roughly 75% of the total number of international tourist arrivals. In addition, the recent popularity of Korean culture (so called "HanRyu") in those countries has increased tourist arrivals.

Given the aforementioned reasons, the Korean government has recently noticed the crucial role of tourism and hospitality industry in the path of green growth and is eager to promote its tourism and hospitality industry internationally. The Green Growth Initiative is a policy that emphasizes environmentally sustainable economic progress to foster low-carbon and socially inclusive development in Korea. The Visit Korea Year 2010-2012 is a campaign for introducing the elegance and flavor of South Korea to international tourists, and it was introduced as part of the green growth plan. South Korea in 2009 started a campaign to attract 10 million international tourists annually by 2012. The new goal is exciting hotel operators, who have long relied on business travelers to fill their rooms. In recent years, rooms at top hotels have been remodeled and menus reinvented to highlight the best of Korean cuisine. The campaign has been viewed as an excellent opportunity to highlight Korean culture. In addition, tourism operators warn that while the country has good infrastructure for business travel and events, it still needs to continue to invest in leisure attractions to compete with other destinations in Asia.

The discussion above implies that actors and actor coalitions are important and there is increasing evidence of multilevel patterns of governance and transnational networks of influence on climate change and other global environmental issues. Although several economic, environmental and technological policies would produce an emission reduction, with respect to climate change, emissions reduction means implementing policies to reduce greenhouse gas emissions and enhance sinks. For example, specific industry sectors where effective production is far below the maximum feasible production with the same amount of inputs have opportunities to adopt win-win policies. Such policies free up resources and bolster growth, meet other sustainable development goals, and incidentally reduce greenhouse gas emissions relative to baseline. Of course, these policies may have winners and losers, but compensation mechanisms can be designed to make no one worse off in the process. Conversely, sectors where production is close to the optimal given available also have opportunities to reduce CO2 emissions by meeting other sustainable development goals. Policy makers can then weigh the CO2 emissions reduction potential against other sustainability aspects of the action in choosing an appropriate policy to implement. In this way, sustainable master planning provides a strategic framework toward the planning, operation and maintenance of sustainable economic growth. Emphasis should be placed on sectors with high potential for green growth, which contributes to protecting and preserving the environment and identifying how these activities can accelerate the transition to green growth.

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