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The Economic Impact of Ecotourism on Regional China: Further Evidence from Yunnan and Sichuan Provinces

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The Economic Impact of Ecotourism on Regional China: Further Evidence from Yunnan and Sichuan Provinces

Abstract

This paper contributes to the literature on the economic impact of ecotourism in regional China with a focus on Yunnan and Sichuan provinces, which attract about 50% of the total number of tourists visiting China annually. Our analysis suggests that tourism significantly contributes to value added output, income and employment generation in Yunnan and Sichuan provinces, although the level of contribution varies between the two provinces. For example, the impact of an additional tourist dollar would be higher in generating employment and household income in Yunnan province, while the same dollar has a higher impact in generating value added in Sichuan. While in both provinces international tourists generate much higher income per capita than their domestic counterparts, in comparison with Sichuan, Yunnan is considered to be better placed for further development of tourism, particularly eco-tourism. The promotion of eco-tourism, in these provinces will also encourage the Chinese youth to stay in their own provinces rather than to migrate to export processing provinces—a problem that has already created a concern among the Chinese policymakers.

JEL Classification: L83; Q01; Q57; R11

Key Words: Tourism, Yunnan province, Sichuan province, Ecotourism, China, Economic impact.
I. Introduction

The Chinese economy has grown at a rate of almost 10% per annum over the past two decades. During this period, tourism has made a significant contribution to growth. According to the World Travel and Tourism Council (WTTC) estimates the direct and indirect impact of tourism on the Chinese economy appears to be around US$152 billion, generating 54 million jobs (WTTC, 2003). Subsequent estimates suggest that total income from tourism has reached up to US$230 billion by 2010. Within the tourism industry, ecotourism has become one of the fastest-growing sectors, recording annual growth of 10-15% worldwide (Miller, 2007; Fan & Oosterhaven, 2005). Similar trend has been observed in the global tourism industry over the past 15 years, where growth of ecotourism has been three times faster than that of tourism industry as a whole (Honey, 2006).

Eco-tourism has been defined as “*responsible travel to natural areas that conserves the environment and improves the well-being of local people*” (TIES, 1990). According to Honey (1999), there are seven characteristics of ecotourism which involve travel to natural destinations, minimizing negative impact on environment, building environmental awareness, providing direct financial benefits for conservation, providing financial benefits and empowerment for local people, respect for local culture and, support for human rights and demographic movements. While there are some studies on the impact of ecotourism on other Chinese provinces, there has not been any study investigating the benefits of eco-tourism to Yunnan and Sichuan Provinces which have emerged as leading ecotourism destinations within China (see, Tisdell, 1996; Nianyong & Zhuge, 2001; Stone and Wall, 2004 and He et al., 2008).¹ Both Sichuan and Yunnan provinces have many ecotourism attractions, while they demonstrate significant diversity in terms of size (land area), population, ethnic composition and industry structure (see, Table 1 below).

¹ These two provinces are located in the Southwest of China and they are well-known tourist destinations. They are ranked highest among the top four provinces in China based on their tourism offering.
The aim of this paper is to shed light on the economic impact of ecotourism on regional China, with particular reference to the Yunnan and Sichuan Provinces, which attract 50% of tourists visiting China annually. The investigation of this issue is particularly important given that in the current policy debate in China the role of ecotourism in regional development has been completely ignored.

The rest of the paper is structured as follows: Section II provides a brief profile of the two provinces under consideration, while Section III describes the analytical context, methodology and data. Section IV presents an analysis of the results, while section V concludes the paper.

2 A Brief Profile of Yunnan and Sichuan Provinces

Yunnan province is located in China’s South-West region sharing borders with Myanmar, Laos and Vietnam. It comprises 394,000 km² (4.1% of China’s total land area), spanning over 865km from East to West and 980kms from North to South (Yunnan Highway Administration Bureau, 2013). It has a population of 47 million people (in 2014) and has a high incidence of poverty-- well above the national average. About 60% of its population is dependent on agriculture. It has the greatest variety of biological resources among the

<table>
<thead>
<tr>
<th>Rank</th>
<th>Province</th>
<th>World heritage cites</th>
<th>National scenic attraction</th>
<th>National 5A attraction</th>
<th>Historical sites</th>
<th>Forest park</th>
<th>National nature reserve</th>
<th>Geographic park</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sichuan</td>
<td>5</td>
<td>14</td>
<td>3</td>
<td>7</td>
<td>31</td>
<td>22</td>
<td>1</td>
<td>83</td>
</tr>
<tr>
<td>2</td>
<td>Zhejiang</td>
<td>0</td>
<td>17</td>
<td>3</td>
<td>6</td>
<td>34</td>
<td>9</td>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>Yunnan</td>
<td>3</td>
<td>12</td>
<td>2</td>
<td>5</td>
<td>27</td>
<td>17</td>
<td>1</td>
<td>67</td>
</tr>
<tr>
<td>4</td>
<td>Hunan</td>
<td>1</td>
<td>10</td>
<td>2</td>
<td>3</td>
<td>35</td>
<td>14</td>
<td>1</td>
<td>66</td>
</tr>
</tbody>
</table>
Chinese provinces, which includes plants from tropical, subtropical, temperate, and alpine growing zones. Of some 30,000 species of plants found in China, more than half are in Yunnan. These include more than 6,000 species of medicinal herbs and some 2,500 species of endemic flowers and ornamental plants (Encyclopedia Britannica, 2016). It also has 191 species of rare and endangered plants. Yunnan has the third largest forest cover in China, and the province is considered the ecological hotspot but a large number of its species are under threat due to rapid urbanization. The province has rich fauna and flora resources with high biodiversity, but sadly, they are in rapid decline. To overcome this decline, the province has established numerous protected areas (identified as 158 nature reserves spanning over 7.5% of the total land area of the province) with the intention to protect 80% of remaining old-growth forest and 90% of its species.

Yunnan is known for its ethnic diversity hosting the highest number of ethnic minorities over any other province. It is the home to 25 of the 56 registered ethnic minorities in China. Ethnic minorities make over one third of the province’s population, but occupy over two thirds of the land. Yunnan has historically been one of the most poverty stricken provinces in China. However, in recent years poverty has dropped due to globalization of the Chinese economy, leading to the establishment of several labor intensive businesses, including tourism-related (Jiang et al, 2013). ² While tourism has grown in Yunnan it also has an expanding manufacturing sector, which includes industries such as, tobacco, agriculture, machinery, metallurgy, chemicals, building materials and tourism.

Supported by its rich resources, diversity, geography and reasonably developed infrastructure, tourism in Yunnan province makes a significant contribution to economic growth, and provides an important stimulus to other industries (Zou & Li, 2008). Yunnan Province was ranked among the top eight locations for international tourists in 2000 and was the only Western inland province to make the list (Atherinos, 2003).

² Current president Xi Jinping visiting the earthquake hit Yunnan in 2015 stressed the need for poverty alleviation and declared that there remains only five to six years for Chinese to build a moderately prosperous society in all respects (http://news.xinhuanet.com/english/china/2015-01/22/c_133936669_2.htm. This visit and the commitment to promote infrastructure development in Yunnan highlight the significance of tourism to alleviate poverty and uplifting economic wellbeing.
Sichuan Province is located in the upper Yangtze River valley in the South-Western part of the country. It is the second largest of the Chinese provinces and slightly larger than Yunnan, spread over 487,000 km (which is 5% of China’s total land area) and having almost twice the population (81.4 million by 2014) that of Yunnan. Among Chinese provinces it is regarded as one of the major agricultural production regions, producing rice, wheat, rapeseed, citrus fruit, peach, sugarcane, sweet potato and Chinese herbs all accounting for a significant share in Gross Regional Product (GRP). Sichuan is also rich in natural resources, and has a well-developed industry sector. It has become the most industrialized province of southwestern China, which includes iron and copper smelting, the production of machinery and electric power, coal mining, petroleum refining, electronic equipment, textiles, food and the manufacture and processing of chemicals. Sichuan has abundant tourism attractions. It is the home to the giant panda and has four world natural heritages and nine national AAAA grade nature parks, the largest number in China. It is internationally known for scenic attractions include Mt. Emei, Jiuzhaigou Valley and Dujiangyan Irrigation System.

In comparison to Yunnan, the Sichuan province has less ethnic diversity, consisting of only 6.1% of residents belonging to ethnic background. However, like Yunnan, agriculture is a key sector in Sichuan with a 10% contribution towards output and a 51% contribution towards employment generation. Despite some diversity, economies of both provinces heavily rely on tourism. As shown in table 2 below the contributions of tourism to GRP of both provinces continue to rise. In case of Yunnan it rose from about 11% in 2000 to about 14% by 2010, while in Sichuan it is almost doubled, from 6 to 11%, during the same period.

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3 Sichuan was the most populous province in China until Chongqing and adjacent areas were separated from it in order to create the independent province-level municipality in 1997. From economic, political, geographical, and historical points of view, the heart and nerve centre of Sichuan is in the eastern, Sichuan Basin area, also called the Red Basin. Its mild and humid climate, fertile soil, and abundant mineral and forestry resources make it one of the most prosperous and economically self-sufficient regions of China. The area has been seen by some as China in a microcosm and is often viewed as a country within a country. The Chinese call the basin Tianfu Zhi Guo, meaning “Heaven on Earth” (see, Britannica, 2016).
III. Analytical Context, Methodology and Data

In assessing the economic impact of tourism several approaches have been used in the literature. These include SAM modelling (West, 1993 and Wagner, 1997), Input-Output (IO) analysis (Fan and Oosterhaven, 2005) and Computable General Equilibrium (CGE) modelling (Zhou et al., 1997, Dwyer et al., 2004, Gooroochurn, 2004 and Dwyer & Forsyth, 2008). Each of these techniques provides a different perspective on the measurement of economic impact, taking into account the direct and flow-on effects. The use of methodology is dictated by the objective of the study and data availability. In fact, studies into the inter-industry linkages of tourism predominantly show strong backward linkages with supply industries, while forward linkages with purchasing industries are practically absent (Archer, 1995 and Archer & Fletcher, 1996). Given this and the aim of our research, Input-Output (IO) analysis is well-suited to assess the impacts of tourism. The key benefit of using this model is that it is based exclusively on backward linkages (Leontief, 1986 and Oosterhaven & van der Knijff, 1987).

Statistics compiled from the Tourism Administration of Yunnan Province and Sichuan Province, and the

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4 Tourism expenditure mostly comprises final consumption goods, that is, the product or service at the end of a chain of industry inputs.
National Bureau of Statistics of China, and the Tourism Satellite Accounts have been used to estimate the direct impact of tourism in the Sichuan and Yunnan provinces.\(^5\) Average tourism spend in each industry class was multiplied by the number of tourists visiting each province in 2005. These figures for final demand were then entered into the 2005 Input-Output tables for each province to determine the magnitude and type of backward linkages throughout the economy, allowing an estimate of total economic impact (direct and flow-on effects).\(^6\)

IV. Results and Discussion

The number of domestic and international tourists visited Sichuan and Yunnan provinces in 2000, 2005 and 2010 are presented in Table 3. Several interesting observations emerge. First, in general, domestic tourist arrivals are much bigger compared to international tourist arrivals in both Sichuan and Yunnan provinces, and these numbers have been growing over the periods under consideration. A significant increase in domestic tourists is attributed to the growth in income brought about by increased economic activities following economic liberalization program. Second, Sichuan attracts more domestic tourists while Yunnan attracts more international tourists. Third, international tourist arrivals in Sichuan have declined from 2005 to 2010, while this category of arrival has increased in Yunnan province over the three years under consideration.

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\(^5\) The Tourism Satellite Account (TSA) is a standard statistical framework and the main tool for the economic assessment of tourism. The *Tourism Satellite Account: Recommended Methodological Framework 2008* (also known as the TSA: RMF 2008) provides the updated common conceptual framework for constructing a TSA. It adopts the basic system of concepts, classifications, definitions, tables and aggregates of the System of National Accounts 2008.

\(^6\) The choice of the years for the study was constrained by the lack of Input-Output (I-O) Tables on time series basis. The I-O Tables for China are generally available for every five years and 2005 was the latest year for which it was available while working on this paper.
Table 3: Number of tourist arrivals in Sichuan and Yunnan provinces in 2000, 2005 and 2010

<table>
<thead>
<tr>
<th>Province</th>
<th>2000</th>
<th>2005</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domestic Tourists (million)</td>
<td>International Tourists (million)</td>
<td>Domestic Tourists (million)</td>
</tr>
<tr>
<td>Sichuan</td>
<td>54</td>
<td>0.46</td>
<td>131.6</td>
</tr>
<tr>
<td></td>
<td>(14%)</td>
<td>(98%)</td>
<td>(103%)</td>
</tr>
<tr>
<td>Yunnan</td>
<td>38.4</td>
<td>1</td>
<td>68.6</td>
</tr>
<tr>
<td></td>
<td>(79%)</td>
<td>(248%)</td>
<td>(102%)</td>
</tr>
</tbody>
</table>

Note: Figures within parentheses indicate the percentage change over the previous year.

The direct impact of tourism on income is presented in table 4 below, which reveals a trend similar to that of table 3. In terms of total income from tourists arrival it can be observed that: (i) domestic tourists bring more dollar income to the provinces than international tourists, (ii) domestic tourism income has been continuously increasing throughout the period in both Sichuan and Yunnan provinces, (iii) Sichuan province has recorded a growth decline in international tourism income over the two years 2005 and 2010 while Yunnan province has evidenced a continued growth in international tourism income over the same years.

Table 4: Direct impact of tourism on regional income in 2000, 2005 and 2010 (US$ billion)

<table>
<thead>
<tr>
<th>Province</th>
<th>2000</th>
<th>2005</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domestic Tourism Income</td>
<td>International Tourism Income</td>
<td>Domestic Tourism Income</td>
</tr>
<tr>
<td>Sichuan</td>
<td>2.998</td>
<td>0.122</td>
<td>8.515</td>
</tr>
<tr>
<td></td>
<td>(184%)</td>
<td>(159%)</td>
<td>(232%)</td>
</tr>
<tr>
<td>Yunnan</td>
<td>2.215</td>
<td>0.339</td>
<td>4.726</td>
</tr>
<tr>
<td></td>
<td>(113%)</td>
<td>(56%)</td>
<td>(194%)</td>
</tr>
</tbody>
</table>

Note: Figures within parentheses indicate the percentage change over the previous year.
Even though, domestic tourists, in comparison to international tourists, generate more (total) income in these two provinces, a further analysis of Table 3 and Table 4, reveals an interesting but opposite piece of evidence about income generation by tourist arrivals per capita. Table 5 below reveals that per capita income generated by international tourist is higher than the per capita income generated by a domestic tourist in each of the two provinces. To elaborate on this point, we note that each domestic tourist visiting Sichuan province generated an income of US$55, US$65 and US$104 over the three years 2000, 2005 and 2010 respectively, while each international tourist visiting Sichuan province generated US$265, US$298 and US$337 during the same periods. In case of Yunnan province, each domestic tourist generated US$58, US$69 and US$100 over the three years 2000, 2005 and 2010 respectively, while each international tourist generated US$339, US$152 and US$200 over the same three years. On average, in Sichuan province, one international tourist has generated 4.1 times more tourism income than a domestic tourist, whereas in Yunnan province, one international tourist has generated 3.3 times more income than a domestic tourist.

Table 5: Direct impact of tourism on regional income (per capita US$): 2000, 2005 and 2010

<table>
<thead>
<tr>
<th>Province</th>
<th>2000</th>
<th>2005</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domestic Tourism Income</td>
<td>International Tourism Income</td>
<td>Domestic Tourism Income</td>
</tr>
<tr>
<td>Sichuan</td>
<td>56</td>
<td>265</td>
<td>65</td>
</tr>
<tr>
<td>Yunnan</td>
<td>58</td>
<td>339</td>
<td>69</td>
</tr>
</tbody>
</table>

Source: Authors' calculation.

The dollar contribution as well as the multiplier effects of tourism, in terms of, value added, income and employment is presented in Table 6. Our analysis, based on the input-output model, indicates that total value added by tourism in Yunnan and Sichuan provinces are estimated to be about US$2.4 billion and US$1.5 billion respectively (see, column 4 Table 6 below). In terms of multiplier effects, both income and
employment multipliers are higher in Yunnan than in Sichuan province. The flow-on impact of tourism in employment in Yunnan province is 0.8 greater than in Sichuan province. In fact, Yunnan derives more benefit from tourism expenditure than Sichuan in all areas except for value added (0.25 lower), which appears to be due to higher import dependency of the region.

Table 6: Tourism contribution to Value Added, Income and Employment in Yunnan and Sichuan provinces in 2005

<table>
<thead>
<tr>
<th></th>
<th>Direct (US$ billion) (A)</th>
<th>Flow-on (US$ billion) (B)</th>
<th>Total (A+B) (US$ billion)</th>
<th>Multiplier %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yunnan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value Added</td>
<td>1046</td>
<td>1312</td>
<td>2358</td>
<td>1.25</td>
</tr>
<tr>
<td>Income</td>
<td>310</td>
<td>649</td>
<td>959</td>
<td>2.09</td>
</tr>
<tr>
<td>Employment</td>
<td>189,656</td>
<td>711,777</td>
<td>901,433</td>
<td>3.75</td>
</tr>
<tr>
<td><strong>Sichuan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value Added</td>
<td>561</td>
<td>892</td>
<td>1453</td>
<td>1.50</td>
</tr>
<tr>
<td>Income</td>
<td>206</td>
<td>426</td>
<td>632</td>
<td>2.07</td>
</tr>
<tr>
<td>Employment</td>
<td>134,473</td>
<td>398,701</td>
<td>533,174</td>
<td>2.96</td>
</tr>
</tbody>
</table>


Figure 1 presents the distribution of flow-on effects from tourism expenditure across various sectors of the economy, in terms of value added, in Sichuan and Yunnan provinces as well as China as a whole. The most significant impacts are felt on wholesale & retail, transport, agriculture, transportation and other services. This trend is consistent in both provinces and the country as a whole. The distribution of flow-on effects resulting from tourism expenditure, in terms of household income, is shown in Figure 2. Again, the most significant impacts are felt on agriculture, transportation, agriculture and other services. However, the impact on agriculture is significantly higher in Sichuan than that of Yunnan and China as a whole. The distribution of flow-on effects across various sectors of the economy, in terms of employment creation, is
The impact of flow-on effect, resulting from tourism expenditure, on employment generation is larger in agriculture, followed by other services, wholesale & retail and transportation. This is consistent with the economic profile of both Sichuan and Yunnan provinces, but Yunnan once again exhibits the greatest proportional impact. As noted earlier, the economies of Sichuan and Yunnan provinces predominantly rely on agriculture and they are well-known for eco-tourism due to natural beauty. Annually over 400 billion tourists visit these provinces and they tend to spend time in the rural areas, resulting in the demand for goods and services produced locally, including agriculture produce, in addition to imported consumption goods. This appears to be the reason why the most significant impacts of tourism in these provinces are felt on agriculture, wholesale & retail, transportation and other services (see, figures 1, 2 &3).

Figure 1: The distribution of flow-on effects across various sectors in terms of value added, 2005
Figure 2: The distribution of flow-on effects across various sectors in terms of household income, 2005

Figure 3: The distribution of flow-on effects across various sectors in terms of employment, 2005
Since tourism appears to have significant impacts on agriculture, transport, wholesale & retail trade, and other services sectors, it is important to promote tourism by addressing traffic congestion and improving road network as a way of addressing rural poverty, which remain a major development challenge in rural China. Given that transportation has one of the strongest linkages with tourism in both provinces as well as China as a whole, investment in this area could encourage further growth in tourism. This justifies the government’s big push for infrastructure development in the entire country not only Sichuan and Yunnan provinces that we investigated. While we have focused on two important provinces of China that attract significant number of tourists, the findings of this study are equally relevant for other provinces, which rely on agriculture and have begun to attract tourism.

V. Concluding Remarks

This paper contributes to the literature on the economic impact of ecotourism in regional China with a focus on Yunnan and Sichuan provinces, which attract about 50% of the total number of tourists visiting China annually. Our analysis based on the Input-Output (IO) modeling technique suggests that tourism significantly contributes to value added, output, income and employment generation in Yunnan and Sichuan provinces, although the level of contribution varies between the two provinces. For example, the impact of an additional tourist dollar would be higher in generating employment and household income in Yunnan province, while the same dollar has a higher impact in generating value added in Sichuan. It is also revealed that, in these two provinces, international tourists generate much higher income per capita than their domestic counterparts. In comparison with Sichuan, Yunnan is considered to be better placed for further development of tourism, eco-tourism in particular, and generate more employment and income for the local communities through measures such as creating more tourist attractions to lengthen tourists’ stay and stretch their expenditure in the region. The promotion of eco-tourism, and creating new and high paid
jobs in these provinces will also encourage the Chinese youth to stay in their own provinces rather than to migrate to export processing provinces—a problem that has already created a concern among the Chinese policymakers.

Given the relative strengths of eco-tourism characterized by rich resources, diversity and geography in Yunnan and Sichuan provinces, it is reasonable to judge that eco-tourism can contribute a great deal to the economic wellbeing of people in these provinces. By adopting measures such as creating more tourist attractions to lengthen tourists’ stay and increase their spending can provide further increase economic benefits to the locals in terms of more employment and income. However, any future investment will also require protection of the natural environment, resources and unique cultures in these provinces. Further research is needed to shed light on: (i) how the employment of ethnic groups is related to ecotourism and its economic impact, and (ii) how the potential conflicts between eco-tourism and other land competing industries, such as manufacturing and mining.
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