The Study on Strategy of Sustainable Development in Coastal Tourism Resources from the Global Change Perspective

WANG Fang1* and ZHU Dakui2

1 College of Geography and Tourism, Guangdong University of Finance & Economics, Guangzhou 510320, China; 2 Key Laboratory of Coast & Island Development, MOE, Nanjing University, Nanjing 210093, China

Abstract: Global change is induced by human activities and these changes impact tourism development. The transportation system especially aviation consumed by tourists and accommodation facilities in coastal destinations release massive greenhouse gases and contribute to global change. The ocean is very important to the society and the economy, and coastal tourism is one of the main human activities in the coastal zone. Coastal tourism resources are rich in China, and coastal tourism plays a decisive role in the marine economy. Here, we analyze problems and challenges during the development of coastal tourism resources from the global change perspective, and identify key factors for the future and ecologically friendly coastal tourism resource development and management under the framework of sustainable development. Based on our findings we recommend changing the pattern and products of coastal tourism to develop low carbon coastal tourism based on the idea of “green thinking”; more attention on developments of creative tourism products such as ecotourism and alternative tourism; changes to coastal tourism resource utilization by developing low carbon coastal tourism, advocating carbon emission reduction, promoting carbon compensation and carbon economy, and encouraging new energy saving technology application. Stakeholders also need to be considered. All these measures should be implemented and optimized during the process of planning-management-monitoring-evaluation in the dynamic model. Due to limited data on coastal tourism resource development and management in the global change perspective, part of our reference data is from whole tourism research results and this is a shortcoming of our approach.

Key words: coastal tourism resource; sustainable tourism; global change; community involvement

1 Introduction

The Fourth Assessment Report (AR4) of the United Nations Intergovernmental Panel on Climate Change (IPCC) pointed out that global warming is an indisputable fact and 90% likely induced by increasing greenhouse gas concentrations caused by human activities. This anthropogenic warming may result in sudden and irreversible impacts if there are no acts to be done (IPCC 2007). Human activities led to the four main emissions of greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and halocarbon (gas containing fluorine, chlorine and bromine). Among them, the most significant change is concentration, and this has attracted much attention and research. Average annual concentrations of CO₂ has increased from 315.98 ppm in 1959 when records began to 390ppm in 2012. According to the Global Carbon Project (2012), carbon emissions from fossil fuels and cement reached 356×10⁸ tons in 2012, and 46% accumulated in the atmosphere, 26% in the ocean and 28% on land. China has the most significant characteristics of climate warming in the world and over the past century, China’s annual average temperature has increased 0.65±0.15℃, slightly higher than global average temperature range (0.6±0.2℃)(Xu et al. 2005).

Tourism become the world's largest industry in 1992, and has been developing rapidly and contributes to the global and national economy, including gross income, employment, value-add tax, investment and tax payments (World Tourism...
Organization 2003). Tourism has been forecast to be the largest, most concentrated and most competitive industry in the 21st century (Newsome et al. 2002). According to the World Travel and Tourism Council (WTTC), tourism and related activities will contribute 12% to global GDP (gross domestic production) by 2010 (World Travel & Tourism Council and International Hotels & Restaurant Association 1999). Among all tourism activities, coastal tourism contributed more than half. In some coastal countries and districts, tourism is even the most important industry (Yunis 2001). Although coastal tourism is traditional, coastal tourism has undergone the fastest growth among modern tourism activities (Gu 2008; Ehler and Douvere 2007). Coastal areas attract more tourists than inland districts because most large cities are distributed along the coast.

Most research into tourism and global change has focused on the threat of change to tourism. For example, 97% of researchers believe that global changes need to be addressed in tourism research and 36% claimed it would be the future study direction. However, the influence of tourism on global change has received little attention (Yang 2010), such as CO2 emissions from fossil fuel consumption during tourism (Becken 2004; Wall 1998). Accompany the increasing influence of global change on natural resources which tourism is dependent on, the influence of tourism activities on global climatic change has been realized (The International Ecotourism Society [TIES] 2007). Globally, an estimated 5% of CO2 emissions, and a significantly higher share of the radiative forcing caused by all greenhouse gases, is attributed to tourism (UNWTO 2007). The Djerba Declaration on the 1st conference on climate change and tourism of the World Tourism Organization (UNWTO) underlined interplay between tourism and global change. The declaration pointed out global changes could have some effects on tourism destination and tourism flow and greenhouse gases produced by energy consumption during touring could also be one important factor of global warming (Becken 2004; Gössling 2002). Just because tourism is not the traditional industry in the system of national accounting, the energy consumption and carbon emissions from tourism have not been included in national statistics. However, the collection of these data is very important to the sustainability of tourism (Becken and Murray 2006). The protection and the sustainable development of coastal tourism resources could bring about mutual benefits for the coastal environment and tourism industry. This paper discusses the sustainable development measures of coastal tourism resources from the global change perspective.

2 Main issues in the development of the coastal tourism resources under global change

Although tourism is regarded as the smokeless industry, the cleanliness is relative. As an important component, coastal tourism produces many job opportunities in the tourism destination and supplies the chance for the tourist to enjoy the ocean and natural environment, but it also brings a lot of destruction to the coastal environment (Wang and Jiang 2006). The safety of coastal tourism resources is influenced by global change and the carbon emissions from coastal tourism also have an effect on the global change.

2.1 Environmental effects of coastal tourism

Oceans makes up 71% of the earth’s surface, has plenty of resources and accessibility, is an important component of global life support systems, is valuable wealth for humans to realize sustainability and will be the most important space for human activity in the 21st century (Crooks and Turner 1999). Among components of the ocean, the coastal zone is the most important and where large cities are located (around 2/3 of cities) (Crooks and Turner 1999) and most global economy assembles (Crooks and Turner 1999). Over half of the global population lives within 60km of ocean (Woodroffe 2002) and around 70% live within one day’s walking distance (Brown et al. 2002). The coastal zone is very vulnerable and readily influenced by human activities, such as fisheries, traffic and tourism.

Coastal tourism destinations attract a huge number of tourists, such as in Europe where 63% of favorites are coastal destinations (European Commission 1998). Coastal tourism promotes the development of mass tourism and leisure tourism. Many leisure tourists chose coastal districts, especially the tropical coast, such as Bali in Indonesia, Brazil, Cuba, Dominica and Malaysia, tropic islands in Polynesia, Queensland in Australia, Thailand, and Florida and Hawaii in America. Before protections were put in place in these areas, some serious and irreversible ecological destruction occurred (Xu and Hu 2009).

The development of coastal tourism promotes local economic growth, creates jobs, improves transportation and infrastructure construction, and provides comfortable fresh experiences for tourists to promote health of body and mind (Caldwell and Smith 1988). Frequent and high intensity coastal leisure activities concentrated in the coastal zone which is fragile put great pressure on and even threaten ecological security. In the next few decades, the trend is expected to continue, and is likely to accelerate (Ian 2002). The healths of coastal tourism destinations are increasingly threatened, and ultimately affect the function of coastal wetlands as the carbon sink to ease global change (MA Board 2005). The continuing growth of coastal tourism and pressure from economic gains often leads to contradictions between tourism development, the local community and natural resources. Table 1 lists the environmental impacts of coastal tourism.

2.2 Contribution of coastal tourism to global change

In coastal tourism districts with environmental vulnerability, unrestrained tourism development is always in conflict with
the coastal environment. The NOAA stated that the quantity and diversity of leisure tourism activities exceeded all other human activities in coastal and offshore areas (Brown et al. 2002). Frequent and heavily intense leisure tourism activities could change or even damage coastal ecological systems (Gedan et al. 2009), and this could influence global change. For direct and indirect carbon emissions, present research can not quantify the volume but some studies have researched direct emissions from fossil fuel consumption in tourism activities, including traffic and accommodation (Scott et al. 2012).

Landscape heterogeneity is one characteristic of the attractive coastal tourism district. The more heterogeneous the destinations are, the more attractive to the tourist. Among all tourist processes, traffic produces the most carbon emissions, especially air travel (ESSP 2012). The environmental effect of long-distance air travel has been one key direction of sustainability tourism research. According to recent research, the greenhouse gas emissions from air traffic make up 3.4%–6.8% of global emissions (and about 40% of global CO₂ emissions) (Becken and Murray 2006). With further increases in international air travel the ratio of greenhouse gasses from air traffic will significantly grow (Gössling et al. 2007; Gössling and Peeters 2007; Penner et al. 1999).

Emissions from air travel are particularly harmful because they are released in the upper troposphere and lower stratosphere (Sausen et al. 2005); emissions from air travel may induce radiative forcing which is an important factor in global warming, and may be between a confirmed minimum of 1.9 and up to 5.1 times as environmentally harmful in terms of their contribution to global warming as emissions from surface bound traffic. Considering these impacts, the contribution of aviation to global warming may be in the order of up to 9% (European Federation for Transport and Environment 2006; Gössling 2009). The use of other traffic tools such as cars and ships is also an important source of CO₂ emissions in tourism. Globally, transport accounts for about 24%–28% of all energy-related CO₂ emissions (Fulton and Eads 2004).

Among all tourism sectors, the hotel is considered to be the main energy consumer (Chan and Mak 2004). Lundie et al. (2007) used input-output analysis methods, such as for tourism caused by environmental measurement, showed that the lodging industry is the main driver of tourism energy input: 16%–29% of total energy demands. This is because of catering and recreational facility lighting and refrigeration and heating systems; a higher than local standard of living; and the price on energy consumption.

### 2.3 The response of coastal tourism resources to global change

Coastal tourism is greatly dependent on the environmental quality. Most coastal zones have beautiful weather, opulent sunshine, rich oxygen and ozone and fresh air. Some coastal districts are always chosen as a summer resort. At the same time the comfortable environment and the rich aquatic life in the coastal zone make it easy to develop sightseeing tours, leisure tours and sporting activities.

The influence of global change on coastal tourism is concentrated on the response of the coastal environment to slowly rising of sea levels. Sea level rise would aggravate a series of natural disasters, such as storm surge, salt-water intrusion, coastal erosion and coastal flooding. In some low lying land areas, some tourism destinations will disappear. According to the report by US Newsweek in 2010, 100 tourist attractions are at the risk of vanishing and of these coastal tourist attractions comprise 20% (Table 2).

### 2.4 The present condition of coastal tourism and related resources in China

As a large country in the west Pacific, China has a mainland coastline of 1.8×10⁴ km and 1.4×10⁴ km of island coastline where most population is concentrated (Zou 1999). In the progress of economic development and social modernization, the coastal zone has had an important role in China (Yu 1994; Wang 1992). The coastal economy began to increase steadily in the 1970s and then rapidly in the 1990s. The annual rate of the GDP increase of coastal related industries reached 20% (Li 2006). In 2009 marine employment reached 32.7 million in China, with 520 thousand new jobs. Among all marine industries, marine transportation industry, coastal tourism and marine fishery made up 76.8% of the total added value of the marine industry (SOA 2010). The coastal provinces with 40% of the area support 40% of the population and 60% of GDP (NBS 2006).

In the past 30 years tourism in China developed rapidly with steady increase except in 2003 (Cui 2008). In 2008, the number of inbound tourists went up to 1.30×10⁸, foreign exchange income from international tourism was 408.43×10⁸ USD, the number of domestic tourists was 17.12×10⁸ and produced the income of 11.600×10⁸ CN¥ (CNTA 2009). Coastal tourism has been a very important industry in the marine economy of coastal provinces (Table 3). Among 53 coastal cities, the number of excellent tourism cities is 42 which accounts for 15.5% of all excellent tourism cities (Tian 2008). Until 2005, coastal tourism...
destinations of the AAAA number 44 and coastal cities own 2318 star grade hotels with 63.54% average room occupancy. In coastal districts travel agents number 7706, including 670 international travel agents and 7306 domestic travel agents (Zhang et al. 2007). Coastal leisure tourism is the prioritized tourism product during the 11th Five Year Plan (Liang 2006). Although the number of international coastal tourist has grown, most coastal tourism destinations lack significant international recognition. With the arrival of the leisure tourism period, the increase in coastal tourists will allow for the development of Chinese coastal tourism (Joudrey and Wallace 2009).

In China, coastal and offshore ecological systems have great importance in biogeography and the social-economy (Qiu et al. 2009). Because of rapid population increases, economic development and environmental degradation, the coastal zone is facing unprecedented challenges. Fishers rely on the exploitation of coastal resources (Cui and Liu 2006) and the population has been over 6 million (Cui and Liu 2006). Quick transformation to the modern market economy, industrial expansion and urbanization has resulted in habitat degradation and resource overdevelopment (Li et al. 2006). Although coastal economic development including coastal tourism has gained satisfactory achievements, pressure from economic increases has brought bigger risk (Zou 1999). Since the 1950s, coastal exploitation and urbanization has removed 50% of coastal wetland, 70% mangroves and 80% of coral reefs (SOA 2002). Among all coastal industries tourism relies on the coastal environment and could be an efficient means to achieve sustainable development of coastal resources.

3 The content and dynamic model of sustainable development measures of coastal resources

In the global change perspective, the popularity of coastal tourism and the development of mass tourism would promote the tourist and manager to realize the necessity of sustainable tourism (European Commission 2000). The sustainability of the planning and management could motivate the sustainable social-economic development and environmental protection (Orhon et al. 2007).

3.1 Sustainable tourism

The earth summit in Rio in 1992 claimed that tourism could be the best means to create sustainable economies.

Table 2 The coastal tourism sites at the risk of vanishing in the world.

<table>
<thead>
<tr>
<th>Coastal tourism sites at the risk of vanishing</th>
<th>Asia (8/25)*</th>
<th>America (12/22) *</th>
<th>Europe (8/17) *</th>
<th>Africa (4/16) *</th>
<th>Oceania and Antarctica (8/11) *</th>
<th>Arctic (4/9) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maldives; Bangkok in Thailand; Komodo Island in Indonesia; Ganges Delta in Bangladesh; Kushiro wetlands in Japan; Mergui archipelago in Myanmar; Sulu - Sulawesi in Malaysia; Mekong Delta in Vietnam</td>
<td>Mississippi Delta in USA; Trinidad in Cuba; Honduras; Valdes Peninsula in Argentina; Great Southern California Cape in USA; Bartlett in New York; Bering Sea; Kauai in Hawaii; Caribbean; Recife Philippines in Brazil; Rio de la Plata Uruguay; Western Hudson Bay in Canada</td>
<td>Finnish Archipelago Sea; Halligan Islands in Germany; Venice; Copenhagen; Rotterdam; Aegean; Wadden Sea; Thames</td>
<td>Niger Delta; Mahajanga Bay; Madagascar; Nile Delta; St. Louis in Senegal</td>
<td>Antarctic Peninsula; Solomon Islands; Bay of Plenty; New Zealand; Tuvalu; Great Barrier Reef; Ross Ice Shelf in Antarctica; Vava’u Islands, Kingdom of Tonga; Australia’s Kakadu wetlands</td>
<td>Arctic; Pollin Bay in Canada; Ilulissat Ice Fjord in Greenland; Nunavut in Canada</td>
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</tbody>
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* Numerator/denominator: numerator is the number of coastal tourist attractions at risk of vanishing (44 in all); denominator is the tourist attractions at risk of vanishing (100 in all).

Table 3 The economic statistics of coastal tourism in 5 years in China.

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount (100 million CNY)</th>
<th>The added value of seaside tourism</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ratio in total output of main marine industries in China (%)</td>
<td>Ratio in total tourism revenues in China (%)</td>
</tr>
<tr>
<td>2005</td>
<td>5052</td>
<td>29.7</td>
</tr>
<tr>
<td>2006</td>
<td>4706</td>
<td>25.6</td>
</tr>
<tr>
<td>2007</td>
<td>7748</td>
<td>31.08</td>
</tr>
<tr>
<td>2008</td>
<td>8329</td>
<td>28.08</td>
</tr>
<tr>
<td>2009</td>
<td>9174</td>
<td>28.7</td>
</tr>
</tbody>
</table>

and promote the people to protect diversity. For tourism planning, sustainability is the philosophy and guiding principle but not the specific method.

According to the World Tourism Organization (WTO) in 1996, sustainable tourism can satisfy the demand of contemporary tourists and the local area, satisfy the protection and can strengthen the future development opportunities. Sustainable tourism development can be considered as the dominant mean of all resource management, in order to realize the economic, social and aesthetic needs, meanwhile maintaining cultural integrity, key ecological process, biological diversity and life support systems (Shah et al. 2002). Sustainable tourism needs to meet three principles: improving the quality of host community life; offering high quality tourist experiences; and maintaining the environmental quality of the destination (Ding and Pigram 1995). So far, the UN General Assembly has accepted sustainable tourism as a part of the agenda in the 21st century.

Sustainable tourism and resource protection are of mutual influence and interdependence (Fig. 1). Sustainable resource exploitation and management is the foundation of sustainable tourism. Sustainable tourism would not consume other renewable energy except for the tourist transportation. Community resources, such as traditional culture, specialty shops and recreational facilities are the resource base of tourism. Tourism could promote the cyclic regeneration of traditional natural resources and could supply financial incentives for natural and cultural protection. Tourism can greatly promote understanding between people and the global consciousness. More and more scholars have pointed out that tourism is a chance for the Third World to transform and develop. The transformation through tourism has been thought as sustainable and fair (Mowforth and Munt 1998).

Moscardo (2008) argued that one option to develop new ways of thinking and innovation in tourism is to argue that there is no such thing as sustainable tourism, then a number of new approaches to tourism development emerge, and stronger links may emerge between tourism and other economic activities and development options. According to Wall (1997), the real question to be asked about tourism and sustainability is “whether and in what form might tourism contribute to sustainable development”? Further it could be argued that few tourism authors have explicitly contemplated the concept that tourism may not be an option for sustainable development in some destinations. In some districts the influence brought by tourism are underestimated.

3.2 The dynamic model of development and management of sustainable coastal tourism

The sustainable coastal tourism development and management has four aspects: (i) keeping ecological integrity and biological diversity; (ii) satisfying human demands, including improving the quality of local community and stratifying the aesthetic needs of tourists; (iii) guaranteeing the people of different generations equal share of the economic benefits and tourism resources; and (iv) coordinate development of coastal environmental protection, integrate social culture and sufficient economic income.

The dynamic model of sustainable tourism resource development and management shows in Fig. 2. There are two key factors. First are green thinking, rational planning, developing low-carbon coastal tourism economy and

![Fig. 1 The value and principle model of sustainable tourism (Hall et al. 1997)](image1)

![Fig. 2 The dynamic model of sustainable coastal tourism development and management.](image2)
improving the quality of resource development. Through reasonable planning and impact assessment of tourism resources, to study, control and coordinate carbon emissions in destinations, and explain related planning and regulation. To improve the coastal tourism resource utilization pattern, protect and improve the resource conditions. Carry out risk assessment of tourism resource development, and improve the level of scientific management and technology application. Bring the environmental cost, social benefits and economic benefits together into the decision-making process. Good planning without good execution will become idealistic empty talk with nowhere to go.

Second, take the stakeholders into consideration, especially local residents. In order to obtain sustainable tourism, planning should combine public interest and be planned by experts in a “neutral” position who can provide resource development planning. In recent years, research and practice on local resident participation in tourist destinations has increased.

4 Strategy for the development and management of sustainable coastal tourism

Although all human activities including coastal tourism could cause global change, the travel experience is a human instinct and one with welfare benefits. In some countries coastal tourism is also an important mean of economic development (Forstner 2004). Compared with other development modes, tourism is a relatively green exploitation. The Davos Declaration of the WTO states that tourism can rapidly respond to global change.

4.1 Coastal tourism model and transformation

Several new tourism models and products have emerged, including ecological tourism, low-carbon tourism, Lohas tourism and so on. Ecological tourism has been thought as having the most potential and the new tourism model proposes mass tourism activity will be ecological such as green consumption and environmental protection. The speed of ecological tourism has exceeded the average speed of tourism with the speed of 10%–15% globally. Ecological tourism accounts for one fifth of the tourism market and 20% international travelling and creates annual income of USD 20 billion (Page and Dowling 2002). Ecological tourism has been the predominant direction of tourism (Cater and Lowman 1994). Because ecological tourism has prevailed in coastal zones, many coastal wetlands with abundant rare and endangered species have been kept as the research and education base and tourist destinations (The Bureau of the Convention on Wetlands 2010).

Alternative tourism is another new type of exploratory tourism (Table 4). In alternative tourism all values including natural, social and communities’ are brought and would make the subject and object of the tourism enjoy the positive and valuable interaction, sharing and experience. Alternative tourism grew in the late 1970s and early 1980s when the drawback of mass tourism appeared and part tourist began to refuse mass tourism and turned to look for some small and low-key tourism with community involvement. In alternative tourism, the number of tourists decreased but all involved could receive more education.

4.2 The transformation of coastal resource utility

Under the present background with the increasing consciousness of global environmental protection, green products and green consumption could be favored and encouraged by common people and government. Under the
global green trend how to manage and exploit the tourism resources will be the most important issue of the tourism research.

Some specific measures for low-carbon tourism development are: protectively exploit the tourism resources; enlarge the investment for development of science and technology to reduce emissions; reward those tourism exploitations with low-carbon emissions; encourage purchasing the local materials in the accommodation and catering industry and impose a carbon tax for the outside purchase; encourage increasing the efficiency of energy utility and using environmental friendly cleaning product and green energy; introduce waste reuse and processing systems and build rubbish classification systems; and attract environmental tourists. For example, after the Hilton International Hotel changed energy utility, CO$_2$ emission decreased by 5.1% and energy consumption by 6.7%; 1.7 million GBP in energy output was saved (Blake 2007).

Carbon offset in coastal tourism development has two types: biological sink and increasing the energy utility or renewable energy. Studies have shown that most voluntary carbon offsets would pay most or part attention on forestry projects and less than 25% will pay attention to projects related to renewable energy and energy efficiency (Gössling et al. 2007). The coastal zone has a high advantage for new energy development, such as tide energy, wind energy, solar energy and biological energy. Promoting carbon-offset projects could achieve a win-win between resource protection and financial income. Some nations such as Norway, Costa Rica, New Zealand, Scotland, Sri Lanka and Iceland recently announced they intend to develop carbon-offset tourism. Carbon emission reduction could raise the profile of natural and sustainable tourism (Gössling 2009). Effective and feasible standards to constrain the development of coastal tourism resources are needed, such as: (i) ecological labels and organic/green certification system to encourage travel agencies to positively develop environmental protection and energy conservation; the tourism destination can attract tourists through ecological labels and organic/green certification. (ii) Encourage the aircraft industry to employ new technology and fuel-efficient aircrafts. Until 2040 it is estimated that the most fuel-efficient aircraft could decrease fuel consumption by 28%-35% but it is still not enough compared with growth of the aircraft industry (Peeters and Middel 2006). And (iii) encourage package tour by bus or by carpool and build a separate lane to promote green travel ways. Encourage gas, battery and solar cars and design the stimulus measures and tax reduction and separate parking.

### 4.3 Stakeholder collaboration

Stakeholder collaboration is of crucial importance because tourism can only be sustainable when the benefits and interests of all stakeholders are in balance. In one UNESCO biosphere reserve in the west Caribbean where overuse of marine resources has damaged the ecological system (Mow et al. 2007) proposed anew tourism resource planning scheme in which all stakeholder collaboration is involved.

#### 4.3.1 Feasibility and model with community involved

The community is the biological habitat and also the tourism destination. The community is the developer of the tourism and a part of tourism resources and it is also the beneficiary. The local community has gradually been thought as the core of the tourism product (Wang and Lu 2005) and has been taken as the important factor in tourism exploitation. Many studies have gained the common view that the development of sustainable tourism should be built on the community (Richards and Hall 2000). Support from the local community is vital for the applicability of tourism planning, efficiency of tourism management and policy (Zhao et al. 2005).

If the community joins in the tourism development, it would need some preconditions. First, the community needs to benefit during tourism development. Ross and Wall (1999) indicated that income from the payment would be the incentive for the local community to protect wild animals, forests and rivers. Bovarnick and Gupta (2003) thought just after the local community gained satisfactory income they would be inspired to protect natural resources. The financial income was thought as the right of the community by Scheyvens (1999) but was understood as the social capital to help manage natural resources by Jones (2005). Second, effective participation in tourism development is needed. Okech (2006) suggests the community has the right to supply suggestions for local tourism development and to be involved in the decision-making process. Johnson and Wilson posit that the initiator of community involvement could make naive assumptions of the political structure of the local community. Some failed cases also exist when the community joins in solving reserve management conflict. In Gill, Indonesia, coral reef management based on the community cannot solve the conflict between fishermen and tourism companies and compromise are made. Interactions between tourism destinations and communities are more reliable than pure technology and scientific knowledge when managing the coastal tourism destination (Eagles and McCool 2002).

According to the level of involvement, three types of community involvement can be classified (Fig. 3). First, the community controls the tourism industry, such as the chateaus around Niagara Falls in Ontario, Canada. Second, the community involves part of the management, including financial involvement and management involvement. In some well-developed destinations, the natives open family restaurant and become the important component of these industries. The community adopts the joint tourism exploitation with outside developers, such as building the joint-stock cooperative company (Zhuge et al. 2000) or the involvement of “the company + household” (Weng and...
Yang 2004). Community involvement can also be involved in management, including the primary involvement in tourism destination development with the intention expression, and community co-management in decision-making. Third, the community does not participate in tourism development. There are three types: (i) community share profits. Wu argued that the interests of local residents have priority among tourism benefit distribution (Wu and Ye 2005). Bao also claims to share the tourism benefits with the locals who do not involve tourism through collective fund compensation and secondary distribution (Bao and Sun 2003). (ii) Get economic compensation. The tourism development impacts the local community. Through the economic form to compensate the resident is a way used in tourism, especially natural tourism. And (iii) the community is completely isolated. The community gets no economic compensation or benefit share in tourism development, and there is no reflection of public opinion. The reason is the community does not care about tourism development or is not aware of their rights and obligations or is consciously or unconsciously isolated from the speaking rights by authorities.

4.3.2 Other stakeholders
Tourists are the core of tourism activities. During designing a tourism management strategy the developer needs to know tourist opinions, attitudes and intentions and make clear the potential influence of tourism activities and tourist responsibilities. A survey in Australia and New Zealand shows that half of tourists question the relationship between global change and tourism but 48% of tourists are willing to counteract greenhouse gas emissions through planting trees (Becken 2004).

The government is the important driving force in the development of tourism resources, especially in China. Although global change has been receiving increasing attention by governments and advertisement in the media, media advertisements always lack accuracy and non-science (Zehr 2000). The exaggerated and despised advertisement of global change would confuse the ideas of stockholders and blur the significance of sustainable tourism development. In addition, governments need to determine the resource baseline and conduct risk assessments and divide sensitive areas according to core-buffer theory.

International organizations of tourism protection and development could supply macro guidance for sustainable coastal tourism development and management. In some districts where the stakeholder may not publicly express an attitude about tourism development, the decision rights will fall to foreign departments, such as nongovernmental organizations or consultants (Wilson 2006). International organizations include the UN International Tourism Organization, World Tourism Organization and World Tourism and Travel Association. Other related organizations are the World Bank, United Nations Development Program, International Air Transport Association, International Civil Aviation Organization, Organization for Economic Cooperation and Development, the Organization of American States, the Pacific Asia Travel Association and European Tourist Board.

5 Conclusions
This paper summarizes problems and challenges during the development of coastal tourism, figures out the key factors and proposes a dynamic model and strategies for coastal tourism development and management. We recommend: transforming coastal tourism models and products, advocating green and low-carbon tourism and developing ecological and alternative tourism products; changing resources utility of coastal tourism, encouraging low-carbon emission and energy-saving technology; strengthening cooperation of stockholders and advocate community involvement to balance the interests and clear the responsibility of stockholders, including the local community, tourists and governments; and putting all measures in a dynamic model of planning-management-
monitoring-evaluation cycle to optimize.

Because of the limited data this study is immature and cites part of the data from the whole tourism data set not only that of global-change influenced coastal tourism. However, as global change and costal tourism grow in importance this paper will hopefully stimulate further work.

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基于全球变化视角的滨海旅游资源可持续发展对策研究

王 芳1，朱大奎2

1 广东财经大学 地理与旅游学院，广州 510320；
2 南京大学 海岸与海岛开发教育部重点实验室，南京 210093

摘 要：滨海旅游是传统的、主要的旅游资源形式，也是现代旅游增长最快的领域，在国内外均具有举足轻重的地位。全球变化很可能由于人类活动引起，并影响着旅游业的发展。旅游业通过使用交通运输系统尤其是航空旅行、旅游目的地住宿餐饮等活动排放大量温室气体，对全球变化做出贡献。可持续滨海旅游以可持续的资源开发和管理为基础，在全球变化视角下，要达到这一目标，需要在滨海旅游模式与产品类型转变、旅游资源利用方式转变、利益相关者协作等方面对滨海旅游资源进行优化开发和有效管理；以绿色思维指导低碳旅游模式，发展生态旅游和替代性旅游等新型产品；提倡降碳减排、发展碳补偿和实践。

关键词：滨海旅游资源；可持续旅游；全球变化；社区参与