



A Systematic Review of Sustainable Wine Tourism Research in Asia 2000-2018

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Abstract

Wine tourism has recently expanded from its traditional destinations, such as Europe, Australia, South Africa and the Americas', into emerging and new markets in other areas, including the rest of Africa and Asia. The purpose of this paper is to identify the state of academic research in a specific region of the world. The authors present a systematic literature review of wine tourism research in Asia, which aims to provide an overview of the relevant current research trends, including destination development, sustainability, consumer behaviour and marketing strategies for Asian wine tourism. In addition, the paper discusses diverse research approaches and perspectives on wine tourism in Asia; while continually offering a synthesis of the findings and thus providing a starting point for future research. Given that wine tourism is still relatively new for Asian destinations, many of these studies focus on wine tourism development, the environment and sustainability and consumer behaviour. In each category of the comparative analysis, specific differences in the research topics of researchers in Asian countries represent the variety of local wine tourism development. The analysis identifies both strengths and weaknesses that countries need to confront in order to acquire a strategic competitive advantage in the wine industry and its tourism related aspects. A comparative analysis is provided based on the research into wine tourism in the two most popular destinations in Asia—China and Thailand, although other destinations have been reviewed as well. Finally, further recommendations with the prediction of further intentions to fully develop the local wine tourism systems are provided for different cases. This is the first systematic review focusing on Asian wine vineyard tourism.

Keywords: Sustainable Asian vineyard wine tourism, Asian wine tourism, oenology, viticulture.

Introduction

While the diverse development of tourism provides several new options for travellers, wine tourism compels certain attention from this researcher in order to detail the potential of this tourism niche. The definition and conceptualisation of 'wine tourism' have not resulted in a uniform approach. Wine tourism has been defined as 'visitation to vineyards, wineries, wine festivals and wine shows for which grape wine tasting and/or experiencing the attributes of a grape wine region are the prime motivating factors for visitors' (Hall & Mitchell, 2000). Several years later Carlsen (2004) advocated that wine, food, tourism and fine arts collectively form the essential foundations of the appreciated and respected wine tourism industry. Recently, the Asian wine community adopted a definition of wine tourism as the engagement of winery and vineyard visitations that motivate tourists to experience unique wines, winescapes and



other relevant activities in the local wine region, such as wine festivals and wine shows (Zhang & Qiu, 2011; Ye, Zhang & Yuan, 2017).

The development of wine tourism is not limited to regions or countries with an advantageous beverage tradition and culture, such as Europe and the United States, but also extends to emerging and new potential markets in other areas, including South Africa and Asia. Since Asia has been relatively neglected by early research on wine tourism, this paper conducts a systematic review of wine tourism literature on Asia from academic research spanning nineteen years (2000–2018) in order to provide an overview of the relevant research trends, in particular in light of concerns about sustainability in wine tourism development, as well as issues related to government support for the industry and consumer behaviour.

Specifically, 89 papers were identified as related to Asian countries. Still, it is necessary to acknowledge that the scope of this paper's research is limited for several objective reasons, such as copyrights and limited online access. Therefore, although the number of research papers pertaining to sustainable wine tourism in Asia may be greater, this study has identified and compiled 89 researched academic papers and projects from journals, conferences proceedings and book chapters provide the foundation for understanding the current research into the sustainable development of Asian wine tourism.

Methodology

This systematic literature review adopts a combination of qualitative and quantitative methods. It aims to identify the dedicated and non-dedicated research on Asian wine tourism, focusing on the topics of sustainable development, marketing, consumer behaviour and destination development. This methodology requires rigorous data analysis of the collected research in order to be present and determine what can be learned. The data analysis of the collected papers is useful for future research into wine tourism because the research knowledge can facilitate the scholarly understanding of the research field. Thus, the systematic literature review functions as primary research to provide comprehensive coverage of wine tourism in Asia. Specifically, the systematic review will help to cover the search range of relevant papers on the topic of wine tourism, such as wine production, tourism and hospitality management and sustainable development with wine tourism. Unlike a single study conducted separately, a systematic review synthesizes the research outcomes progressively. The scope of the systematic review is delimited based on the criteria for the inclusion or exclusion of selected papers. As concerns the structure of the systematic literature review, the research is conducted through five separate stages, including defining the research questions, searching for relevant data, extracting data, assessing the data quality based on specified criteria and analysing the data in order to obtain a result.

In the first stage, the methodology aims to answer the following research questions: 'What is the focus of wine tourism research in Asia from 2000–2018?' and 'What are the differences in research on wine tourism of different countries in Asia, such as China, Thailand and Vietnam?'. Subsequently, the search for relevant data was conducted using two approaches as follows: (1) using Internet search tools to approach the most current academic data and (2) tracking the relevant conference papers, journal databases, library catalogues, specific professional websites, books sections and graduate theses. Since the field of study is limited to Asian papers, over 200 relevant papers were searched and eliminated based on specific search terms and contents. Finally, the relevant data were extracted based on the most general yet relevant keywords: for instance, 'Asian wine tour' 'Asian wine tourism' and 'sustainable Asian wine tour' and the like, to ensure that the papers are related to the field at certain levels.

In addition, the research looks at the specific criteria of authority and coverage, including the author's name, academic record, date of publication and research citations, to name just a



few, in order to ensure the accessibility of further research in similar fields. In this systematic review study, the collected papers are assessed based on the age of the material (articles must be fewer than 18 years old, due to the nascence of this niche venue of tourism), the design of the studies (quantitative, qualitative or mixed-methods are accepted). As well, assessments are also made based on geographic conditions (the article must be researched in Asia or about Asian wine tourism) and relevance to the expounded topics (sustainable development, wine tourism development in particular regions of Asia, marketing for wine tourism and wine production and quality in Asia). Therefore, the fourth stage of data quality assessment proceeds based on the specified criteria of the study, including wine tourism development in particular regions of Asia, sustainable development, and marketing. For instance, as concerns the sustainable development of wine tourism in Asia, the searched topic depended on environmental and ecological concerns of winescapes, marketing strategies, legal constraints, wine consumer behaviour, wine quality and other relevant socio-economic factors to specify the dedicated and non-dedicated research. In the case of duplication of research due to identical authors, each study is considered a separated piece. Finally, the stage of data analysis proceeds based on the results of specific statistics about the collected papers to present the trends and characteristics of current research in the field of Asian wine tourism. In addition, further implications are identified from the synthesis of the collected data to suggest further recommendations for further research in this field. Although the systematic review does not include human objects as participants, further ethical concerns are necessary to ensure that the data and information are collected lawfully and that the information is reported accurately.

Inclusion and Exclusion Criteria of the Studies

The studies are confronted with several problems of authentication due to the strong development of electronic platforms and websites. For example, the rapid turnover of website content in some ways create transient literature. For another example, some papers cannot be accessed online due to copyright and limited contents. New contents from different sources and research, however, are presented and updated regularly to ensure that the results are always diverse. In this paper, conference papers, book sections and journals are concerned with references from several relevant conferences, national and international reports and published products. In fact, this paper needed to filter the non-academic sources (blogs, non-credited articles and PowerPoint slides) to ensure the credibility of the sources. The assessment criteria for the sources focus on authority, coverage and currency subsequently. In terms of authority, the authors are required to be academic professionals in order to improve the reliability of the sources.

The studies in the systematic review are selected based on the conditions of scholarly coverage and currency, especially in terms of tourism and hospitality management. The source collection process encounters certain challenges due to the lack of access to certain sources, which results in the incomplete source content of some papers. As concerns the authentication of the sources, there was inevitable omission of certain significant sources from the systematic review due to the technological limitations of the internet.

It is prudent to mention that the systematic review of wine tourism development in Asia does not confront the problems of string research by the same authors. Therefore, it is not necessary to exclude any papers because Asia does not have a long history of research on wine tourism compared with other wine regions of the world. In fact, the research in the systematic review does not focus on further development stages of wine tourism but rather on the basic considerations of wine tourism in Asia. For instance, the sources focus on wine production standards, product quality, environmental concerns, infrastructure demands, customer behaviour and branding strategies. Although the systematic review focuses on wine tourism development in several Asian countries, non-English studies are excluded. As well, the series of annual reports is also excluded because the review employs only the most recent



report. In terms of researchers' concerns, the paper also considers their total number of research studies and projects in the relevant fields when filtering the dedicated research to that which directly discusses the matters of wine tourism development in Asia. Thus, the paper tries to minimise non-dedicated research and maximise the studies dedicated to the specific concerns of wine tourism development.

Systematic Review

The 89 papers comprised journal publications (67), book sections (7), conference proceedings (15) and one Ph.D. dissertation. There were very few publications for the first years of the review period, but research has increased significantly since 2011 (Table 1).

Table 1. Asian Wine Tourism Research by Type of Publication, 2000–2018.

Year	Journal	Book section	Conference/Dissertation paper	Total	Authors	Source
2000	2			2	Ogle (2000)	Journal: Asia Pacific Journal of Tourism Research
					Tonmanee & Kanchanakoo (2000)	Journal: Water Science and Technology
2001	2			2	Nilnond (2001)	Journal: Grape production in the Asia-Pacific.
					Joannon, Poss, Korpraditsku, Brunet & Boonsock (2001)	Journal: Water Science and Technology
2002				0		
2003	1			1	Lisdiyanti, Katsura, Potacharoen, Navarro, Yamada, Uchimura & Komagata (2003)	Journal: Microbiol Cult Coll
2004				0		
2005	1			1	Lee, Zhao & Ko (2005)	Journal: Journal of Hospitality & Tourism Research
2006	2	1	2	5	George (2006)	Journal: Tourism Review
					Henkel, Agrusa & Tanner (2006)	Journal: Asia Pacific Journal of Tourism Research
					Possingham (2006)	Conference: International Symposium on Grape Production and Processing 785
					Schaefer (2006)	Conference: International Symposium on Grape Production and Processing 785
					Webster (2006)	Book section: World Bank Office
2007	3	1		4	Khanal & Babar (2007)	Journal: CUTS Hanoi Research Center
					Do, Patris & Valentin (2007)	Book Section: Products and Assessors



					Woraratphoka, Intarapichet & Indrapichate (2007)	Journal: Food Chemistry
					Teh & Cabanban (2007)	Journal: Journal of environmental management
2008	5		1	6	Batra (2008)	Journal: Anatolia
					Li, Kang, Zhang, Li, Zhu & Zhang (2008)	Journal: Hydrological Processes: An International Journal
					Shen & Cottrell (2008)	Journal: International Journal of Tourism Policy
					Jouquet, Bottinelli, Podwojewski, Hallaire & Duc (2008)	Journal: Geoderma
					Tongrod, Jaroensutasine, Tuantranont & Kerdcharoen (2008)	Conference: World conference on agricultural information and IT, IAALD AFITA WCCA 2008
					Yanagida, Sriannual & Chen (2008)	Journal: Letters in applied microbiology
2009	1		1	2	Sun, Ma, Hao, Pretorius & Chen (2009)	Journal: Annals of microbiology
					Tongrod, Tuantranont & Kerdcharoen (2009)	Conference: Electrical Engineering/Electronic, Computer, Telecommunications Information Technology, 6th International Conference
2010	7		1	8	Lacher & Nepal (2010)	Journal: Tourism Geographies
					Lai, Juang & Chen (2010)	Journal: Soil Science & Plant Nutrition
					Li, Cheng, Li, Chen, Yan, Han & Reeves (2010)	Journal: International Journal of Food Microbiology
					Sarkar (2010)	Journal: Atna-Journal of Tourism Studies
					Slavich, Tam & Think (2010)	Conference: 19th World Congress of Soil Science: Soil Solutions for a Changing World
					Lieu (2010)	Journal: Ultrasonics Sonochemistry
					Poolsawat, Tharapreuksapong, Wongkaew, Reisch & Tantasawat (2010)	Journal: Journal of Phytopathology
					Butkhup, Chowtivannakul, Gaensakoo, Prathepha & Samappito (2010)	Journal: South African Journal of Enology and Viticulture



2011	5		2	7	Li, Liu, Xue & Liu (2011)	Journal: World Journal of Microbiology and Biotechnology
					Lirong (2011)	Journal: Energy Procedia
					Liu (2011)	Conference: Management and Service Science (MASS), 2011 International Conference
					Metasit Watchaneeporn & (2011)	Journal: Management
					Sofield & Li (2011)	Journal: Journal of Sustainable Tourism
					Tang, Shi & Liu (2011)	Journal: Energy Procedia
					Zhang & Qiu (2011)	Conference: Artificial Intelligence, Management Science and Electronic Commerce (AIMSEC), 2nd International Conference
2012	7	1	1	9	Commins, Asavasanti & Deloire (2012)	Journal: Asian Journal of Food and Agro-Industry
					Dabphet, Scott & Ruhanen (2012)	Journal: Journal of Sustainable Tourism
					Guo, Jiao, Li, Wu, Crowley, Wang & Wu (2012)	Journal: Journal of bacteriology
					Han (2012)	Book section: Trans Tech Publications
					Lee & Chang (2012)	Journal: Leisure Studies
					Noppé (2012)	Conference: Cape Wine Academy, Capetown, South Africa
					Sompong, Wongkaew, Tantasawat & Buensanteai (2012)	Journal: African Journal of Microbiology Research
					Sutawa (2012)	Journal: Procedia economics and finance
					Wirudchawon (2012)	Journal: Journal of Ritsumeikan Social Sciences and Humanities
2013	8		1	9	Banks, Klinrsisuk, Dilokwanich & Stupples (2013)	Journal: EchoGéo
					Guo, Zhang, Zhang & Province (2013)	Journal: Markers
					Limtong & Kaewwichian (2013)	Journal: The Journal of General and Applied Microbiology
					Le, Thi Nguyen & Van Nguyen (2013)	Journal: Asia Pacific Journal of Marketing and Logistics



					Liu, Li, Qi, Guo, Liu, Wang & Cheng (2013)	Journal: Plant Disease
					Ohe (2013)	Journal: Journal of Global Management Research
					Sangsnit (2013)	Conference: UNWTO Conference on Sustainable Tourism Development
					Wei (2013)	Journal: Res J Appl Sci Eng Technol
					Zhang Qiu, Yuan, Haobin & Hung (2013)	Journal: International Journal of Contemporary Hospitality Management.
2014	4		1	5	Dobronauteanu (2014)	Journal: EU-Japan Centre for Industrial Cooperation
					Jaykumar & Fukey (2014)	Journal: Issues
					Demir (2014)	Journal: Türk Tarım ve Doğa Bilimleri Dergisi
					Lao-Hakosol & Walsh (2014)	Journal: South Asian Journal of Business and Management Cases
					Tsze (2014)	Conference: Conference collections SIC Sociosphere
2015	6	1	1	8	Hao, Li & Cao (2015)	Book section: EDP Sciences
					Li, Kang, Zhang, Du, Tong, Ding & Xiao (2015)	Journal: Agricultural Water Management
					Liu, Qin, Song, Ye, Yuan, Pei & Liu (2015)	Journal: World Journal of Microbiology and Biotechnology
					Muangasame & McKercher (2015)	Journal: Journal of Sustainable Tourism
					Santoro (2015)	Conference: Kandidatafhandling/ Graduate theses [2744].
					Thipsingh (2015)	Journal: Procedia-Social and Behavioural Sciences
					Wang, Sun & Chang (2015)	Journal: PloS one
					Yan, Jayawardena, Goonasekara Wang, Zhang, Liu & Bahkali (2015)	Journal: Fungal Diversity
2016	3	1	3	7	Dutton (2016)	Conference: 9th Academy of Wine Business Research Conference
					Gu, Qiu & King (2016)	Conference: 9th Academy of Wine Business Research Conference
					Hao, Li, Cao & Ma (2016)	Book section: EDP Sciences



					Sripholtaen, Charoenchai & Urairong (2016)	Journal: Asia-Pac J Sci Technol
					Lu, Habib, Barrett & Chen (2016)	Journal: Phytotaxa
					Lu, Wen & Chen (2016)	Journal: Systematic Botany
					Li & Bardaji de Azcarate (2016)	Conference: XI Iberian Conference on Rural Studies.
2017	7		2	9	Chong (2017)	Journal: Asia Pacific Journal of Tourism Research,
					Lee, Bruwer & Song (2017)	Journal: Current Issues in Tourism
					Li & Bardaji de Azcarate (2017)	Journal: OENO One (Journal international des sciences de la vigne et du vin)
					Lia & Bardajib (2017)	Conference: XI Congreso de la Asociación Española de Economía Agraria
					Wongnarat & Srihanam (2017)	Journal: <i>Orient Journal Chemical</i>
					Yang (2017)	Conference: Doctoral Dissertation, Seoul National University Graduate School.
					Yap & Chen (2017)	Journal: Tourism and Hospitality Management
					Ye, Zhang, & Yuan (2017)	Journal: Journal of Hospitality & Tourism Research
					Dang, Nguyen, Dao, Yang, Li, Yang & Lu (2017)	Journal: Systematic botany
2018	3	1		4	Gu, Qiu Zhang, King & Huang (2018)	Journal: Journal of Travel & Tourism Marketing
					Joy, Belk, Charters, Wang & Peña 2018	Book Section: Emerald Publishing Limited
					Ju, Liu, Tu, Zhao, Yue, Zhang & Meng (2018)	Journal: Food Chemistry
					Wang, Liu, Wang, Zhu & Lin (2018)	Journal: Journal of Mountain Science
Total	67	6	16	89		

The papers are from academic journals which published articles about wine tourism development in Asia since 2000 (Table 2). There are 35 articles on China because the economy of this country has developed rapidly in recent decades. Such strong economic development increases the demands of the Chinese market for wine tourism as a result of Western cultural influence. In order to construct a high-quality wine industry for tourism purposes, several research studies have been conducted concerning wine production, quality, marketing and the sustainable development of vineyards around the country. In China, most vineyards are developed in the northern regions of the country, such as Xinjiang and Ningxia, with special support and strategies from the government.

Besides, the systematic literature review also identifies 31 articles from Thailand and 9 articles from Vietnam, two of the most potential wine regions in Southeast Asia. These articles not



only provide information about basic infrastructural preparations of the Southeast Asian countries, but also signify the unique characteristics of grape productions and other relevant biochemical factors in the tropical areas. While Thailand has competitive advantages to develop strong wine tourism regions in Khao Yai, Vietnam reveals the specific potential to improve wine quality in Ninh Thuan province, thus indicating practical implications for further advantages in the sustainable development of wine tourism in this coastal region. Based on the research concerning the topic of wine tourism development in Thailand and Vietnam, the systematic literature review obtains a more similar comparison between the tropical viticulture's with regard to the sustainable development of wine productions. In this way, the research reflects the special concerns of researchers to construct a unique perspective of the wine tourism development in tropical regions.

The journals focus on tourism and hospitality, sustainable development, the marketing of wine industries and production in China, Thailand and Vietnam, to name just a few. There are also discussions of wine production and quality in several countries with references to the biochemical influences of the products in particular vineyard regions. Other than China and Thailand, few studies have been conducted on the wine tourism development of other countries in Asia because the wine production in these countries is not globally recognised. In other words, the limited information and data on wine tourism in several Asian countries, such as Vietnam, Myanmar and Japan, derives from the low awareness of wine tourism in these countries.

Table 2. Countries Cited in the Research.

Country	Number of papers	Papers
China	35	Gu, Qiu & King (2016) Gu, Qiu Zhang, King & Huang (2018) Guo, Zhang, Zhang & Province (2013) Guo, Jiao, Li, Wu, Crowley, Wang & Wu (2012) Han (2012) Hao, Li & Cao (2015) Hao, Li, Cao & Ma (2016) Ju, Liu, Tu, Zhao, Yue, Zhang & Meng (2018) Li, Liu, Xue & Liu (2011) Li, Kang, Zhang, Du, Tong, Ding & Xiao (2015) Li, Kang, Zhang, Li, Zhu & Zhang. (2008) Li, Cheng, Li, Chen, Yan, Han & Reeves (2010) Li & Bardaji de Azcarate (2016) Li & Bardaji de Azcarate (2017) Lia & Bardajib (2017) Lirong (2011) Liu, Li, Qi, Guo, Liu, Wang & Cheng (2013) Liu, Qin, Song, Ye, Yuan, Pei & Liu (2015) Liu (2011) Noppé (2012) Santoro (2015) Shen & Cottrell (2008) Sofield & Li (2011) Sun, Ma, Hao, Pretorius & Chen (2009) Tang, Shi & Liu (2011) Tsze (2014) Wang, Liu, Wang, Zhu & Lin (2018) Wang, Sun & Chang (2015) Wei (2013) Yan, Jayawardena, Goonasekara, Wang, Zhang, Liu & Bahkali (2015) Yang (2017) Yap & Chen (2017) Ye, Zhang & Yuan (2017) Zhang Qiu, Yuan, Haobin & Hung (2013) Zhang & Qiu (2011)
Thailand	31	Banks, Klinrisuk, Dilokwanich & Stupples (2013)



		Batra (2008) Chong (2017) Commins, Asavasanti & Deloie (2012) Dabphet, Scott & Ruhanen (2012) Henkel, Henkel, Agrusa, Agrusa & Tanner (2006) Lacher & Nepal (2010) Metasit & Watchaneeporn (2011) Muangasame & McKercher (2015) Niinond (2001) Ogle (2000) Sangsnit (2013) Sompong, Wongkaew, Tantasawat & Buensanteai (2012) Tongrod, Jaroensutasinee, Tuantranont & Kerdcharoen (2008) Tongrod, Tuantranont & Kerdcharoen (2009) Thipsingh (2015) Webster (2006) Wirudchawong (2012) Butkhup, Chowtivannakul, Gaensakoo, Prathepha & Samappito (2010) Demir (2014) Joannon, Poss, Korpraditskul, Brunet & Boonsock (2001) Lao-Hakosol & Walsh (2014) Lisdiyanti, Katsura, Potacharoen, Navarro, Yamada, Uchimura & Komagata (2003) Limtong & Kaewwichian (2013) Poolsawat, Tharapreuksapong, Wongkaew, Reisch & Tantasawat (2010) Possingham (2006) Schaefer (2006) Sripholtaen, Charoenchai & Urairong (2016) Tonmanee & Kanchanakool (2000) Wongnarat & Srihanam (2017) Woraratphoka, Intarapichet & Indrapichate (2007)
India	4	George (2006) Sarkar (2010) Jaykumar & Fukey (2014) Joy, Belk, Charters, Wang & Peña (2018)
Japan	3	Dobronauteanu (2014) Ohe (2013) Yanagida, Sriannual & Chen (2008)
Vietnam	9	Le, Thi Nguyen & Van Nguyen (2013) Khanal & Babar (2007) Dang, Nguyen, Dao, Yang, Li, Yang & Lu (2017) Do, Patris & Valentin (2007) Jouquet, Bottinelli, Podwojewski, Hallaire & Duc (2008) Lieu (2010) Lu, Habib, Barrett & Chen (2016) Lu, Wen & Chen (2016) Slavich, Tam & Thinh (2010)
Korea	2	Lee, Bruwer & Song (2017) Lee, Zhao & Ko (2005)
Taiwan	2	Lee & Chang (2012) Lai, Juang & Chen (2010)
Bali	1	Sutawa (2012)
Myanmar	1	Dutton (2016)
Malaysia	1	Teh & Cabanban (2007)

The 67 journal articles were collected from numerous journals, such as the *Asia Pacific Journal of Tourism Research*, the *Journal of Travel & Tourism Marketing* and the *Journal of Bacteriology Issues*. The contents were dedicated to hospitality and tourism, wine, business and environmental management, among others (Table 3).

Most articles were taken from different journals, while only a few publications are represented by more than one article, including the *Asia Pacific Journal of Tourism Research*, the *Journal of Sustainable Tourism*, the *Journal of Tourism and Hospitality Research* (3 publications) and *EDP Sciences*, *Current Issues in Tourism*, *Leisure Studies* and *Energy Procedia* (2 publications each).



Table 3. Research Articles by Journal.

Journals	Articles
Asia Pacific Journal of Tourism Research; Journal of Sustainable Tourism; Journal of Tourism and Hospitality Research.	3
EDP Sciences; Current Issues in Tourism; Leisure Studies; Energy Procedia, Systematic Botany, Water Science and Technology.	2
EchoGéo; Asian Journal of Food and Agro-Industry, Geographical Review; Tourism Review; Journal of Travel & Tourism Marketing; Journal of Bacteriology Issues; Food chemistry; Tourism Geographies; Soil Science & Plant Nutrition; Asia Pacific Journal of Marketing and Logistics; World Journal of Microbiology and Biotechnology; Agricultural Water Management; Hydrological Processes: An International Journal; International journal of food microbiology; Journal international des sciences de la vigne et du vin; Plant Disease; World Journal of Microbiology and Biotechnology; Journal of Global Management Research; Atna - Journal of Tourism Studies; International Journal of Tourism Policy; African Journal of Microbiology Research; Annals of microbiology; Procedia economics and finance; Journal of environmental management; Water Science and technology; Procedia-Social and Behavioral Sciences; Journal of Mountain Science; PloS one, Res J Appl Sci Eng Technol; Journal of Ritsumeikan Social Sciences and Humanities; Fungal Diversity; Letters in applied microbiology; Tourism and hospitality management; International Journal of Contemporary Hospitality Management, South African Journal of Enology and Viticulture, Türk Tarım ve Doğa Bilimleri Dergisi, Geoderma, South Asian Journal of Business and Management Cases, Ultrasonics Sonochemistry, The Journal of General and Applied Microbiology, Phytotaxa, Journal of Phytopathology, Asia-Pac J Sci Technol, Orient. J. Chem, Food Chemistry, Microbiol Cult Coll.	1
Total number of journal articles	67

Table 4 shows a cross-tabulation between the research categories and the sectors of countries that conduct the research, including China, Thailand, and other countries in Asia. The articles devoted to environment and sustainability issues are about 64.4%, including Sustainability Development in Wine Tourism (27.5%), Microbiology and Bacteriology in Wine Production (20.6%), Grape Production and Vineyard Development (37.9%), and Natural Factors and Resources (13.7%). Similarly, the human factor categories can be found in 35.6% of the articles, including Wine Tourist Behaviour (31.2%), Economic Factors and Marketing Strategies (34.3%), and Governmental Strategies of Wine Tourism Development (34.5%). China is the country with the most research studies in microbiology and bacteriology, implying a strong determination to improve the wine quality. Meanwhile, Thailand has more papers in natural factors and resources because the country is developing the basis for further progress in wine tourism. However, in the consumer behaviour categories, Thailand has fewer studies than China. One reason for the many consumer surveys on Chinese consumers is the size of the potential Chinese wine market. In both groups of countries, the size of the category of sustainable development in wine tourism indicates the growing role of this topic. Besides China and Thailand, other Asian countries focus more on studies in consumer behaviour than environment and sustainability. Vietnam also conducts research on wine tourism development with regard to native biochemical characteristic to improve wine production. Thailand and Vietnam have similar climate tropical conditions to develop wine tourism in wineries and vineyards in Khao Yai and Ninh Thuan province. The two countries strongly focus on research in grape production and vineyard development, natural factors and resources to identify the necessary infrastructural and technological conditions of tropical wine tourism in Southeast Asia.

With regard to studies about sustainable development, China does not have many studies on natural factors and resources because the most famous wine regions in this country are already developed for wine production. On the other hand, Thailand does not have many studies in microbiology and bacteriology in wine production because the wine quality in this country is not the priority and wine is not a major export product. For other Asian countries, there is an equal number of studies in all three sub-categories, except the sustainability development in wine tourism. When considering human factors, while China is superior in studies about wine tourist behaviour and economic factors and marketing strategies, Thailand has more studies than China in government strategies of wine tourism development. Although



Thailand strongly focuses on introducing new wine regions, the country needs to pay further attention to marketing and economic aspects of wine tourism to ensure a holistic development.

Table 4. Research Categories and Countries.

Domain	China	Thailand	Other Countries
Environment and Sustainability			
Sustainability Development in Wine Tourism	Han (2012) Hao, Li & Cao (2015) Hao, Li, Cao & Ma (2016) Shen & Cottrell (2008) Sofield & Li (2011) Tang, Shi & Liu (2011)	Webster (2006) Ogle (2000) Sangsnit (2013) Metasit & Watchaneeporn (2011) Muangasame & Mc Kercher (2015) Dabphet, Scott & Ruhanen (2012)	Khanal & Babar (2007) Teh & Cabanban (2007) Sutawa (2012)
Grape Production and Vineyard Development	Yan, Jayawardena, Goonasekara, Wang, Zhang, Liu & Bahkali (2015) Wang, Liu, Wang, Zhu & Lin (2018) Li, Kang, Zhang, Du, Tong, Ding & Xiao (2015) Li, Kang, Zhang, Li, Zhu & Zhang (2008) Li & Bardaji de Azcarate (2017) Guo, Zhang, Zhang & Province (2013)	Tongrod, Jaroensutasinee, Tuantranont & Kerdcharoen (2008) Tongrod, Tuantranont & Kerdcharoen (2009) Nilnond (2001) Butkhup, Chowtivannakul, Gaensakoo, Prathepha & Samappito (2010) Demir (2014) Lao-Hakosol & Walsh (2014) Possingham (2006) Schaefer (2006) Sripholtaen, Charoenchai & Urairong (2016) Wongnarat & Srihanam (2017)	Ohe (2013) Dang, Nguyen, Dao, Yang, Li, Yang & Lu (2017) Do, Patris & Valentin (2007) Lieu (2010) Lu, Habib, Barrett & Chen (2016) Lu, Wen & Chen (2016)
Microbiology and Bacteriology in Wine Production	Sun, Ma, Hao, Pretorius & Chen (2009) Liu, Li, Qi, Guo, Liu, Wang & Cheng (2013) Liu, Qin, Song, Ye, Yuan, Pei & Liu (2015) Li, Liu, Xue & Liu (2011) Li, Cheng, Li, Chen, Yan, Han & Reeves (2010) Ju, Liu, Tu, Zhao, Yue, Zhang & Meng (2018) Guo, Jiao, Li, Wu, Crowley, Wang & Wu (2012)	Sompong, Wongkaew, Tantasawat & Buensanteai (2012) Limtong & Kaewwichian (2013) Poolsawat, Tharapreuksapong, Wongkaew, Reisch & Tantasawat (2010) Woraratphoka, Intarapichet & Indrapichate (2007) Lisdiyanti, Katsura, Potacharoen, Navarro, Yamada, Uchimura & Komagata (2003)	Yanagida, Sriannual & Chen (2008)
Natural Factors and Resources	Wang, Sun & Chang (2015)	Chong (2017) Banks, Klinrisuk, Dilokwanich & Stupples (2013) Joannon, Poss, Korpraditskul, Brunet & Boonsock (2001) Tonmanee & Kanchanakool (2000)	Lai, Juang & Chen (2010) Jouquet, Bottinelli, Podwojewski, Hallaire & Duc (2008) Slavich, Tam & Think (2010)
Human Factors			
Wine Tourist Behaviour	Yap & Chen (2017) Ye, Zhang & Yuan (2017) Zhang Qiu, Yuan, Haobin & Hung (2013) Gu, Qiu & King (2016) Gu, Qiu Zhang, King & Huang (2018) Zhang & Qiu (2011)	Henkel, Henkel, Agrusa, Agrusa & Tanner (2006)	George (2006) Joy, Belk, Charters, Wang & Peña (2018) Lee, Bruwer & Song (2017)
Economic Factors and Marketing Strategies	Wei (2013) Santoro (2015) Noppé (2012) Liu (2011)	Lacher & Nepal (2010)	Jaykumar & Fukey (2014) Le, Thi Nguyen & Van Nguyen (2013)



	Li & Bardaji de Azcarate (2016) Lia & Bardajib (2017)		Lee, Zhao & Ko (2005) Lee & Chang (2012)
Governmental Strategies of Wine Tourism Development	Yang (2017) Tsze (2014) Lirong (2011)	Commins, Asavasanti & Deloire (2012) Batra (2008) Wirudchawong (2012) Thipsingh (2015)	Sarkar (2010) Dutton (2016)

The Body of Research

Research Domains

As indicated in Table 4, seven different domains were identified in the body of research, and these can be based on two categories, namely environment and sustainability, and human factors. The environment and sustainable category contain four domains which identify the natural factors and conditions as well as the policies of the government for sustainable development of wine tourism in the specific country and region (see Fig. 1). This category focuses on the studies that research the development of products and infrastructural conditions in order to develop the products and services for wine tourism. The domains include sustainability development in wine tourism, microbiology and bacteriology in wine production, grape production and vineyard development, and natural factors and resources for wine tourism.

The second category focuses on the human factors that influence the development of wine tourism in Asia. The category aims at studies in economic environment and marketing strategies for the local wine tourism as well as the introduction of the wine region. It includes the following three domains: wine tourist behaviour, economic factors and marketing strategies, and governmental strategies of wine tourism development.

From a qualitative perspective, the figure presents the interaction and overlapping of the categories. Accordingly, the sustainability development in wine tourism focuses on the policies of the government to develop sustainable wine tourism. The domain of grape production and vineyard development emphasizes the role of infrastructural development in wine tourism. Subsequently, the domain of microbiology and bacteriology in wine production signifies the quality of wine production by clarifying the influential factors, including local viruses, yeasts, and bacteria. The domain of natural factors and resources studies the geographical conditions and climate of the wine regions. On the other hand, the domains of wine tourist behaviour study of hospitality and tourism management through the special demands and characteristics of tourists. The economic factors and marketing strategies domain focuses on the profitability and other revenue sources of wine tourism development. Finally, the domain of government strategies of wine tourism development introduces the basic nature of new wine regions for tourism purposes. The seven domains, then, represent the relevant themes in each non-human and human factor that constitute the wine tourism development.

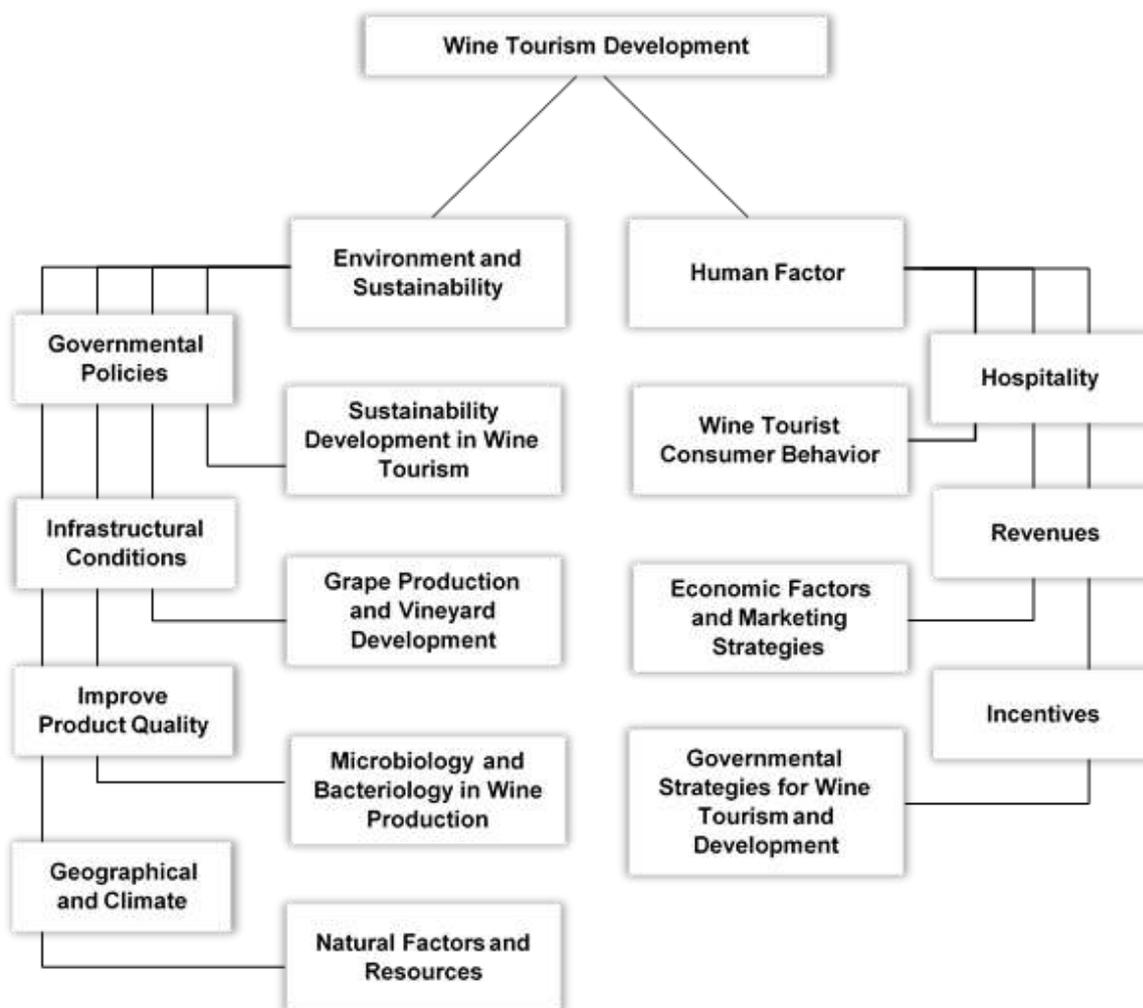


Figure 1. The Relationship of the Research Domains Source: Author's own

Developing Wine Tourism

Although wine tourism has been developed by several wine regions in the world, it is relatively new in Asia, a fact specifically reflected in Chong (2007)'s article "Thailand & wine tourism: a dream or a reality?" to introduce the idea that the government and the local communities might consider developing wine production in national vineyards for tourism purposes. In fact, this article lays out the Thai governmental policies used to develop wine tourism in the Khao Yai vineyard, the most accessible and visited vineyard in Thailand.

During the earlier part of the reviewed period, wine tourism sustainability was not addressed directly in most research about Thailand. However, while not focusing on wine tourism or vineyard tourism the two following examples of early research bear mentioning in the context of sustainability. Dearden (1991) brought into question the idea of sustainable development and tourism in the northern provinces of Thailand although his research was centred on examining the economic benefits of trekking and assessing its community and cultural effects. The research uncovered vast amounts of environmental degradation with examples of deforestation, soil compaction, erosion and litter. However, he warned that these factors of environmentally unfriendly trekking were generally not considered to be a concern at the time for sustaining the hill tribe communities. Then Kontogeorgopoulos (1999) pointed out that the "Amazing Thailand" tourist campaign, while set to bolster tourism was actually forgoing any sustainable practices. Despite opposition at that time the degradation of Thailand's natural resources continued together with tourism development in a constant unsustainable manner.



Only in the second decade of this review of literature did wine tourism research start to address the issues of sustainability. For instance, Metasit and Watchaneeporn (2011) focus mainly on the sustainable development of wine production to ensure that relevant environmental and ecological footprints are minimised. The 2012 research of Commins, Asavasanti and Deloire considered the wine production process in Thailand by introducing tropical wine. These were among the first steps of vineyard branding to establish the foundation for wine tourism development in this particular Asian country. Similarly, the research by Banks, Klinrisuk, Dilokwanich and Stupples (2013) focused on the geographical conditions of several regions in Thailand to assess the necessary qualities for wine tourism development. As a result, research on wine tourism development in Thailand remains at the preparatory level to ensure that all requirements for further stages of development are satisfied.

The systematic review also reflects upon the development of wine tourism in several regions of China from a more holistic perspective in comparison to the research conducted on Thailand. As early as 2011, Lirong's paper "The Prospect and Forecast of China's wine tourism in 2011" analyses the positive and negative aspects of wine tourism in China. In this way, it can be concluded that China not only completed the first stage of wine tourism development but also focused on what would happen next in the development process. Studies by Chinese researchers on the development of wine tourism also focused directly on several aspects of wine tourism, such as wine quality (Yan et al., 2015), geographical conditions for wine tourism (Wang, Sun & Chang, 2015) and biochemical influences from viruses in a specific region (Liu et al., 2013). The studies conducted by Chinese researchers seem to employ more scientific approaches to address the relevant concerns in the most reliable way. This specification in research does not ensure the quality of the literature conducted but rather the scientific approach to the direction of the research. In fact, China has a large market with more economic potential in comparison to Thailand. Besides, the vineyard regions in China also receive stronger governmental investment with respect to Xinjiang and Ningxia. Therefore, it is understandable that Chinese researchers conducted several studies on the development of wine tourism in particular regions.

Environment and Sustainability

As concerns of environment and sustainability in the development of wine tourism in Asia, most studies focus on geographical and soil conditions (Guo, Jiao, Li, Wu, Crowdley, Wand, & Wu, 2012), biochemical (Ju et al., 2018), fermentation (Li, Liu, Xue, & Liu, 2011), and other grape production systems (Guo, Zhang, Zhang, & Province, 2013). Other concerns concentrate on the economic climate for wine tourism development in China (Han 2012), government policy (Hao, Li, Cao, & Ma 2016), ecosystem water (Li et al., 2015) and vineyard evapotranspiration (Li, Kang, Zhang, Li, Zhu, & Zhang, 2008). It can be observed that Chinese wine tourism studies acquire certain levels of specification in different aspects of wine tourism development. The specific considerations of Chinese research not only enhance the sustainability of the development process but also establish a scientific basis for further concerns in terms of environmental and ecological research. In fact, Chinese researchers focus strongly on specific wine tourism regions in the country to conduct their studies, including Ningxia (Hao, Li, & Cao, 2015; Hao, Li, Cao, & Ma, 2016; Yang, 2017), and Xinjiang (Liu et al., 2015). Hence, the objectives and goals of these studies are to limit the environmental and ecological footprint of the wine industry when wine tourism is fully developed and exploited in China.

Besides the research of Chinese wine tourism development, there are other studies about other countries and regions in Asia, including Myanmar (Dutton, 2016), India (George, 2006), the Mekong region (Khanal & Babar, 2007), Taiwan (Lai, Juang, & Chen, 2010) and Japan (Ohe, 2013). These studies focus mostly on the special identities of wine production and the wine industry in the country to introduce the characteristics of wine tourism. The focus of these



studies is mainly on the plans to develop sustainable wine tourism based on ecological and environmental analysis. Although there are fewer studies about sustainable wine tourism development in Thailand than in China, Thai researchers are aware of a variety of different aspects when they conduct research, such as microbiology (Sompong, Wongkaew, Tantasawat, & Buensanteai, 2012), networking in sustainable tourism (Thipsingh, 2015), geographical conditions (Banks, Klinsrisuk, Dilokwanich, & Stupples, 2013) and sustainable tourism policies (Muangasame & McKercher, 2015; Sangsnit, 2013; Ogle, 2000).

In fact, Thailand strongly emphasises the research on the development of a strict yet up-to-date legislative system that would facilitate sustainable wine tourism in the near future. The emphasis on the legislative system would then benefit from the experiences of other developed wine tourism systems in order to avoid unexpected flaws. In addition, there are also concerns about grape production that reflect the strategy of Thailand in order to catch up with the international standard and quality (Nilnond, 2001). Thailand also emphasizes the special biochemical factors in the region to develop unique competitive advantages of tropical wine tourism. There are articles that signify the grape cultivation (Butkhup, Chowtivannakul, Gaensakoo, Prathepha, & Samappito, 2010), tropical grape growing (Demir, 2014), yeast species from grape phylloplane (Limtong, & Kaewwichian, 2013), acid bacteria (Lisdiyanti et al., 2003), grape anthracnose (Poolsawat, Tharapreuksapong, Wongkaew, Reisch, & Tantasawat, 2010), table grape production (Possingham, 2006), tropical wine making (Schaefer, 2006). Other studies focus on wine grape varieties (Sripholtaen, Charoenchai, & Urairong, 2016), and phytochemical and antioxidant activities (Wongnarat & Srihanam, 2017; Woraratphoka, Intarapichet, & Indrapichate, 2007). The researchers also focus on the natural factors and resources of wine tourism development with regard to water and soil pollution (Joannon, Poss, Korpraditskul, Brunet, & Boonsock, 2001), and village farm resort (Lao-Hakosol & Walsh, 2014).

Besides China and Thailand, Vietnam also conducts several studies to specify the potential advantages of wine tourism development. Vietnamese researchers focus on the wine production and vineyard development with regard to the special vitiate specie in Ninh Thuan province (Dang et al., 2017; Lu et al., 2016; Lu, Wen, & Chen, 2016), representation of wine (Do, Patris, & Valentin, 2007), grape treatment (Lieu, 2010). Besides, there are also studies on natural factors and resources, such as different land-use systems (Jouquet, Bottinelli, Podwojewski, Hallaire & Duc, 2008), and water management (Slavich, Tam, & Thinh, 2010). Thus, both Vietnam and Thailand strongly emphasise the environment and sustainability in wine tourism development with regard to natural factors and resources, and grape production and vineyard development. Both Southeast Asian countries also specify the competitive advantage of tropical wine tourism with special local yeast in Thailand and vitiate specie in Vietnam.

As wine tourism is a growing trend in global tourism, the sustainable development of this industry not only enhances the business opportunities for the wine business value chain but also provides several sources of revenue for local communities. The sustainable development of wine tourism requires a balance between economic benefits for the community and ecological footprints. In fact, sustainability may be acquired through the strong participation of the wine producers and tour companies in socially responsible activities. These activities may include a commitment to organic grape production, qualified wine products and charity programs, as well as other programs against deforestation, soil erosion and pollution due to the overuse of fertilisers and chemical substances.

It is also necessary to combine tourism and education to control the long-term effects of sustainable development. Since Asia is a relatively new wine market, Asian tourists may be introduced to vineyards on a wine tour with further instructions on how to appreciate and assess wine products in the most appropriate manner. The educational purpose of Asian wine tourism is, then, to construct a unique Asian wine culture that minimises its ecological footprint.



Moreover, the sustainable development of Asian wine tourism needs to achieve economic benefits, which requires Asian countries to establish appropriate legislative actions and business procedures to facilitate a variety of business partnerships and coordination's. Then, governments play a decisive role in establishing an environment for mutually beneficial interactions among the residents of local wine communities, business partners and tourists to visit the vineyards and experience the wine products. The professional moderation in the wine tourism business during the early stages of development will ensure positive initial branding effects; for instance, creating an association of Asian wine tourism with existing attitudes about healthy Asian lifestyles and beverage cultures would reduce the potential harm of alcoholism. Hence, sustainable development requires cooperation among community engagement, research trends, consumer behaviour, governmental business and legislative support, a strategy for wine tourism, grape production skills and new standards of ecological and environmental protection.

Human Factors

In the case of China, several studies focus on consumer behaviour to specify the requirements of Chinese tourists (Gu, Qiu, & King, 2016) and approaches to marketing strategies (Gu, Qiu Zhang, King, & Huang, 2018; Li & de Azcarate, 2016; Lia, & Bardajíb, 2017; Liu, 2011; Santoro, 2015). Thus, Chinese researchers focus more on the economic aspects of wine tourism development by exploring the role of marketing research. China would like to pose strong competition in the industry in order to ensure that Chinese wine tourism would not be defeated by other well-developed wine regions. Consumer behaviour studies have also been conducted in other countries, such as Japan (Dobronauteanu, 2014), India (Jaykumar, & Fukey, 2014; Joy, Belk, Charters, Wang & Peña, 2018; Sarkar, 2010), Vietnam (Le, Thi Nguyen, & Van Nguyen, 2013), Korea (Lee, Zhao & Ko, 2005; Lee, Bruwer, & Song, 2017) and Taiwan (Lee & Chang, 2012). While these are the countries with the potential for further development of wine tourism, the studies focus on the characteristics of local tourists and communities to introduce the nature of the consumer bases.

The studies on consumer behaviour for wine tourism development in Thailand focus on the policies of the community (Wirudchawong, 2012), the perceptions of national and international tourists (Henkel, Henkel, Agrusa, Agrusa, & Tanner, 2006) and strategies to obtain tourism revenue (Lacher & Nepal, 2010). Accordingly, these studies help create a strong connection between tourists and the local communities for further understanding about the consumer behaviour in wine tourism. The studies also function as the tools that describe cultural differences in order to facilitate the development of Thai wine tourism. In terms of marketing, these studies also emphasise the economic roles of wine tourism and the strategies for acquiring sufficient economic benefits for the local communities. Since the developing wine tourism in Thailand is not as competitive as wine tourism in China, marketing studies will help to discover new competitive advantages that derive from the unique geographical and ecological conditions of the tropical Asian region.

Conclusion

While wine tourism studies mostly cover the significant aspects of sustainable development, research from Asian countries focuses on the development of the wine industry and other concerns of marketing strategies. Thus, research trends reflect the current reality of wine tourism development in Asia. For instance, there is not much focus on environmental concerns in Asian research because the wine tourism in Asian countries is not yet sufficiently developed in terms of infrastructural conditions to pose an ecological threat. On the other hand, the concentration of Asian researchers on the quality of new wines and wine consumer behaviour with specific local characteristics is also an advantage in ensuring a high quality of research and avoiding bias from foreign socio-cultural factors. It is also implied that the systematic review of wine tourism in Asia reflects the existing research concerns of other comparable



developed regions, such as biochemical and geographical studies for grape production. In other words, the concerns about product quality, wine production stages, environmental standards, marketing strategies and the development of wine tourism in specific regions are based on what has been applied and researched in other wine regions of the world. The systematic review acquires and advances the source content to provide a more insightful discussion of further unknown concerns, such as the economic effects of wine tourism, in order to develop wine tourism while avoiding the mistakes of other regions.

In fact, the economic benefits of wine tourism are among the major goals that Asian countries specifically seek to develop and invest further in this field of business. Asian countries need to balance the ecological footprint and economic benefits of wine tourism in order to acquire sustainability in its development. Such a balance can be achieved through the logical legislative framework and support from the local government, the proper geographical zoning for vineyards and infrastructural development for wine tourism, such as streets, hotel, parking areas and restaurants. It is important however, to guide customer behaviour in wine tourism in order to limit its ecological footprint. For instance, pools, tennis courses, casinos and other common types of entertainment used in other forms of tourism would not be constructed so as to emphasise the centrality of wine in wine tourism. Although consumers may not be satisfied with the lack of certain tourism facilities, they would understand that wine tourism is different from other types of tourism. Such a strategy can take as its starting point the fact that wine tourism is in the early stages of development in Asia. Hence, wine tourism in Asia may develop sustainably because Asian countries do not follow the international model of exploiting all-natural resources.

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