Coconut-based Low-carbon Culinary Tourism on Samui Island, Thailand
การท่องเที่ยวอาหารแบบคาร์บอนต่ำโดยมะพร้าว เกาะสมุย ประเทศไทย

- Natthakan Pruksorranan
  PhD Candidate, Tourism and Hospitality Management, Graduate School of Business, Assumption University of Thailand, E-mail : goongnatthakan@gmail.com
  ณัฏฐกานต์ พฤกษ์สรนันทน์
  นักศึกษาปริญญาเอก การจัดการการท่องเที่ยวและบริการ มหาวิทยาลัยอัสสัมชัญ
- Adarsh Batra
  Program Director, Tourism and Hospitality Management, Graduate School of Business Assumption University of Thailand, E-mail: adarshbtr@yahoo.co.in
  ดร.อดาร์ช บาตรา
  ประธานหลักสูตรปริญญาเอก การจัดการการท่องเที่ยวและบริการ มหาวิทยาลัยอัสสัมชัญ

Abstract

This qualitative research aims to provide culinary menu format following low-carbon foodprints consisting of purchasing, preparation and presentation (3Ps) for Samui Island, which is one of the top ten tourism destinations in Thailand among international tourists. The researchers reviewed literature concerned culinary tourism and low-carbon situation. Semi-structured interviews were conducted with supply chain stakeholders (hotel chefs, local farmers, market vendors of farmers and intermediaries. Then, the form of low carbon culinary menus is designed and was verified by chefs, who worked in restaurants and hotels on Samui Island and joined the Samui Chefs Club. The tool was sent via e-mail to professional chefs by purposive sampling and non-probability method to create low-carbon culinary menus for tourists who will come to enjoy culinary tourism on Samui Island. The research applied coding analysis assisting by licensed NVivo11 with the deductive conclusion. The findings included the integration of local coconut production into Samui's coconuts supply chain, low carbon criteria, design cookbook format and low carbon menus categorized by purchase, preparation, and presentation

Keyword: Culinary Tourism, Low-carbon, Samui Island

บทคัดย่อ

งานวิจัยเชิงคุณภาพนี้มุ่งเน้นเพื่อสร้างรูปแบบเมนูอาหารตามแนวคิดคาร์บอนต่ำ ประกอบด้วย การจัดซื้อ (Purchasing) การเตรียมและประกอบอาหาร (Preparation) และการนำเสนอ (Presentation) หรือ 3Ps ให้แก่เกาะสมุย ซึ่งเป็นเกาะ 1 ใน 10 ที่มีชื่อเสียงสำหรับนักท่องเที่ยวนานาชาติ โดยได้ทบทวนวรรณกรรมที่เกี่ยวข้องกับสถานการณ์ของการท่องเที่ยวอาหาร และการบริหารจัดการแบบคาร์บอนต่ำ ใช้วิธีการสัมภาษณ์แบบกึ่งโครงสร้างในกลุ่มมีส่วนเกี่ยวข้องของห่วงโซ่อุปทาน เช่น เชฟ เกษตรกรท้องถิ่น ผู้ขาย และพ่อค้าคนกลาง หลังจากนั้นจึงมีการออกแบบเมนูอาหารคาร์บอนต่ำซึ่งผ่านการตรวจสอบโดยเชฟที่ทำงานในโรงแรมชั้นนำบนเกาะสมุยและเข้าร่วมสมาคมเชฟเกาะสมุย เครื่องมือดังกล่าวส่งให้เชฟอาชีพผ่านทางจดหมายอิเล็กทรอนิกส์ด้วยวิธีเฉพาะเจาะจง เพื่อสร้างเมนูอาหารคาร์บอนต่ำให้แก่นักท่องเที่ยวที่มาเยี่ยมเยือนเกาะสมุย งานวิจัยนี้ใช้การวิเคราะห์แบบการกำหนดรหัสของข้อมูล โดยมีโปรแกรม NVivo11 ด้วยวิธีการนิรนัย ผลในการศึกษาได้บูรณาการสินค้ามะพร้าวท้องถิ่น ห่วงโซ่อุปทานของมะพร้าวสมุย เกณฑ์ในการจัดการแบบคาร์บอนต่ำ เพื่อออกแบบเมนูตามแนวคิดคาร์บอนต่ำ ไปจนถึงหนังสือสอนทำอาหารคาร์บอนต่ำ ซึ่งรวมถึงการจัดซื้อ การเตรียมและประกอบอาหาร อีกทั้งการนำเสนอ

คำสำคัญ : การท่องเที่ยวอาหาร คาร์บอนต่ำ เกาะสมุย

Introduction

The globalization influenced food consumption linked with tourism while the growth of culinary tourism has spread over in many parts of the world. Thai food is one of the famous ethnic cuisines at international level. Thailand tourism has taken this great opportunity to promote sustainable culinary tourism. Still, the generality of the topic was summarized into a statement of the research problem in the case study area: Samui Island the luxury tourist destination. There are many projects related to low carbon and green concept initiated by apex organization such as Tourism Authority of Thailand. The concept of low carbon tourism was developed and discussed all over the world either at national or international level.

Preliminary investigation by the researchers' onsite found that the hotels do not order ingredients from local farmers. While Hotel chefs alleged that the agricultural products do not fit to be used for cooking in the hotel's restaurants kitchen and the local products quantity can hardly meet the required supply to the hotel's restaurants kitchen. It reflects the dilemma local farmers-hotel supply chain weak linkage resulting in economic leakages due to food importation to support the Samui tourism sector. The main agricultural product related to socio-cultural, economic and environment is 'coconut'. Peeraphatchara et al. (2011) agreed Samui Coconut is used to be the

best coconut for Thai curries soup in Thailand. However, Samui Coconuts are nearly extinct by few decades.

Objective

The main objective of the paper is to provide culinary menu format following low-carbon foodprints consisting of purchasing, preparation and presentation (3Ps) for Samui Island in terms of Samui's coconuts within culinary tourism. Samui economy, agriculture, the image of the island had been concerned coconut. Surprisingly, coconut does not sell on Samui Island anymore. Production of coconut and final consumption require collect, package, retail, transport, and cooking, all of which cause overall emissions. Thus there is a need to refresh coconut supply chain from sustainable point of view so that culinary tourism cover neutral journey utilizing local supply chain. If Samui coconuts will be grown more, using local coconut make low-carbon in purchasing while transporting. Careful process in carbon emission during preparation and presentation must be considered according to this research objective.

Literature Review

The culinary tourism is emerging as a form of special interest tourism offering real travel, and introducing travelers to new and existing smells, tastes and flavors, to new cultures, and learning opportunities (Ignatov, 2003). While Long (2004) mentioned it as a way to experience and explore new cultures. Heldke (2003) referred to the culinary tourist as a food adventurer who constantly seeks novel and new experiences around the table. Though food plays an important role in the tourist's experience, it can be a primary motivator for some and a secondary aspect for others (Hall & Sharples, 2003). Smith and Xiao (2008) proposed a more integrated definition of culinary tourism as any tourism experience in which one learns about, appreciates, or consumes local culinary resources and which encompasses both travel motivated for culinary reasons and those in which the culinary experience is not the main reason for the visit. Wolfs (2002) claimed that culinary tourism is in the context of agricultural tourism and includes farm holidays and visiting farmers' markets and fruit orchards, among other activities in which tourists focus specifically on the search for, and enjoyment of, prepared food and drink. The culinary tourism can generate the great benefit to destination and this can make sustainable tourism by local menu using local coconuts.

From culinary tourism linked to supply chain, Atkin and Affonso (2004) studied the generic supply chain for American wineries, and identified three aspects, suppliers, wine business processes, and customers. The research of Hall and Page (2005) identified five aspects, direct sales, industrial food supply chains, producer co-operatives, restaurant supply chain networks, and producers. Moreover, restaurant supply chains (Smith and Xiao, 2008) are included from the starting point of culinary tourists. At restaurants, food and beverage wholesalers and distributors, other supplies (either consumables or semi-durables), and financial services (banks, investors) and credit card companies are involved. Supplies obtained through franchise operations or cooperatives may be included. Food processors, shipping companies (and customs agents), and warehouses are included in the food and beverage wholesalers and distributors. The food processors may be food producers, abattoirs, marketing boards, suppliers of other ingredients (chemicals for preservatives), and packaging suppliers. Seed distributors, livestock breeders and distributors, farm chemicals and fertilizers, business services (insurance, accounting); utilities, and fuel are included in food producers. For abattoirs, it starts from Livestock breeders. While in marketing boards, there are the groups of wheat, dairy, and poultry producers. Thomas-Francois et al. (2017) introduced a model to create value co-creation in a hotel supply chain as a service management approach that involved three stages, service support agencies, farmers, and hotels prior to the consumers. The farmers' cluster organizations and input procurement agencies are the components to strengthen the relationships with service support agencies and hotels to facilitate farm-related services and to develop interest in food sources for leisure, education, and intrinsic value.

This research studied culinary supply chain following farm to fork concept: from farmers, through supplier and chefs with food management theory (3Ps: purchase, prepare and present) in terms of low carbon concept based on Samui Coconuts (Gössling et al., 2011). Purchase decisions have three main elements from a carbon footprint perspective, choice of raw materials, their transport, and the question of seasonality. The choice of raw materials can have a considerable impact on emissions. Different food ingredients have different Greenhouse Gas (GHG) intensities. There is also considerable scientific uncertainty regarding the relative importance of different GHGs in contributing to climate change, as well as the soil-atmosphere flows of carbon for different forms of agriculture and livestock breeding (Smith et al., 2008). Further problems arise with regard to the assessment of the role of transport, with emissions from aviation not being comparable with those from other transport modes on a CO2-equivalent basis (Lee et al., 2015). Food imports

are a particular problem in tropical island states where foodservice providers typically serve high-quality, high-protein foods to upscale tourists. Such tourists often, at least in the perception of hotel managers, expect the foodstuffs they know from home (Pattullo, 2005). In such locations, a large share of the food is often imported by air, including food items, such as soft drinks, dairy products, and vegetables (Gössling & Schumacher, 2010). There are a number of factors influencing the importance of transport in generating GHG emissions, such as the transport mode chosen. Seasonality, foodstuffs are seasonal in many regions of the world, especially fruit or vegetables, but also many fish species and some meats, such as lamb or wild game (Hille et al., 2009). Foodstuffs consumed outside their season need to have been imported or stored, and both can be particularly energy intensive. Many months of cold storage also almost inevitably result in the loss of a amount of the food, which further increases energy usage and GHG emissions per kcal (Hille, 1998). Attempts by foodservice providers to reduce GHG emissions may therefore focus on ensuring that seasonal foods are not used when they are out of season, except perhaps when there are opportunities to store them at minimal energy cost. Purchases should buy as little as possible policy in terms of vegetables grown in heated greenhouses, foods involving air transport, specific species, such as giant, king, and tiger prawns, and lobster, imported beef and aluminum foil. The second stage is preparation. The principal considerations involved in the preparation of food management are firstly how the meal components are chosen and put together, secondly the use of carbon intensive foodstuffs, especially meats, and thirdly how waste is managed. Similarly, avoiding the use of certain kitchen products, for example aluminum foil, may not only help to address concerns about the environmental impacts of such materials but also make a significant contribution to climatically sustainable operations (Kuckshinrichs & Poganietz, 2006). Finally, waste could be avoided by more careful planning purchases. Preparation should purchase energy from renewable sources, use more energy-efficient cooking routines, do not prepare energy-intensive foods in-house, put dishes on the menu that use less meat and more vegetables, prepare meals only after orders have been placed, plan purchases to avoid waste and separate food waste from general waste. Finally, presentation refers to the way in which Foodservice providers serve the meals they have prepared for their customers. The presentation of the meals has significant implications for the choice of food components and the manner of their preparation, and thus can play a major role in efforts to reduce their carbon footprint. Presentation should always present at least one attractive vegetarian alternative, reduce portion sizes at buffets, with

more regular replenishment, reduce plate size at buffets, arrange buffets so that less carbon-intensive foods are at the center, train staff to recommend less carbon-intensive dishes and avoid single-use packaging.

A framework within which these linkages can be strengthened is proposed in Figure 1.

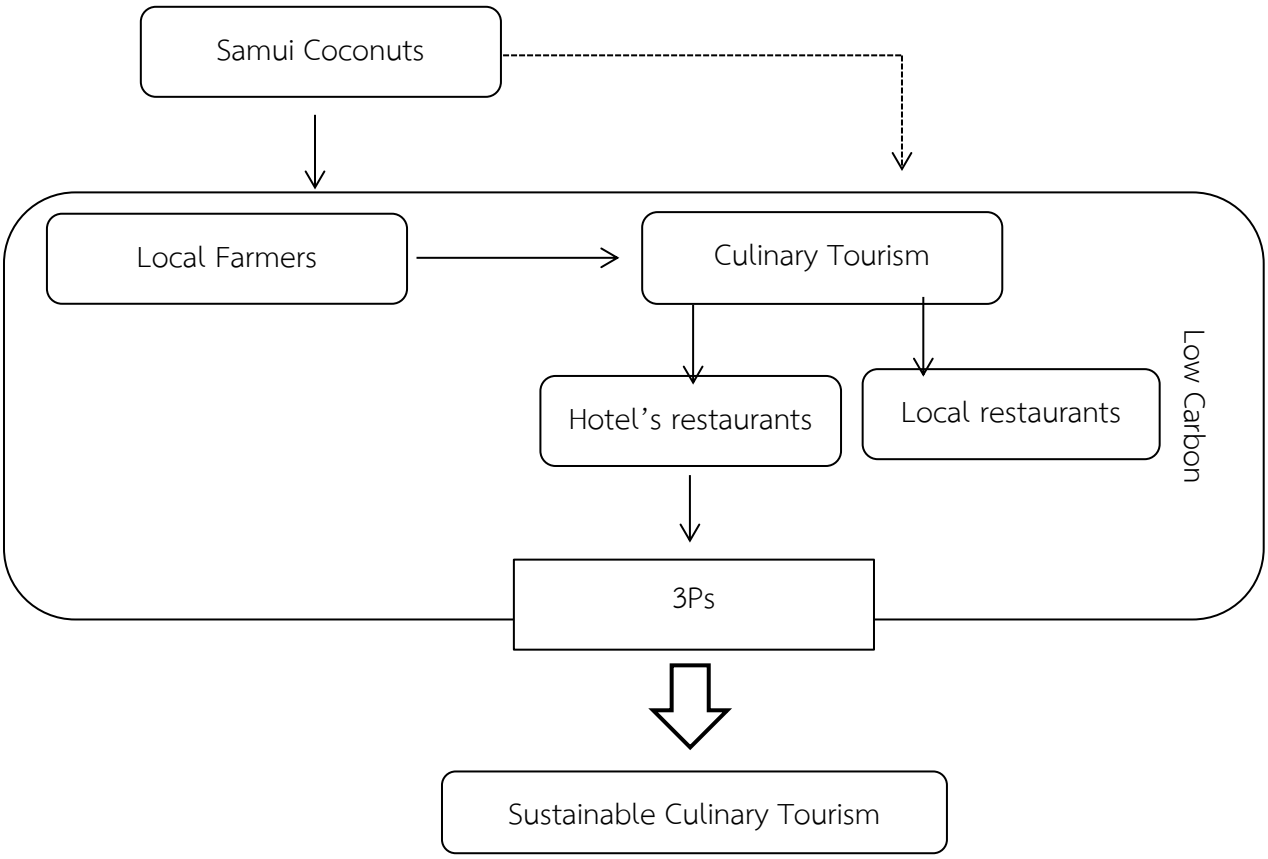

Figure 1 : Research Concept Model

Methodology

This study is an exploratory research by applying qualitative techniques to gather information from both secondary and primary sources. The tools were designed based on Gössling et al. (2011) low-carbon theory on 3Ps and asked 18 executives chefs and 6 sous-chefs based in 20 hotels by purposive sampling in Koh Samui to create the menu using local ingredients in Samui Island which is coconut.

The primary data were collected from April 2012 to May 2016 employing purposive sampling to study the coconut supply chain. The supply chain stakeholders concerned tourism and Samui's coconut were included as a sample of the research. All tourism stakeholders attended the conference conducted by Samui Mueng Municipality in 2012. Restaurants owners and employees

whose main products are local dish and chefs were selected by a purposive sampling in order to have an in-depth interview and contacted personally by telephone. The snowball sampling was also applied. After the experiment workshop, all participated chefs were asked for in-depth semi-structured interviews. A separate interview guide was developed for each stakeholder group. Chefs further referred to intermediary and local market they visited and contacted to purchase the ingredients and coconut. Then, the local market referred to the farmer and intermediate where they get the coconut. For intermediary and farmers, this research applied snowball sampling. The head of the office of Agriculture Department was interviewed to suggest farmers who plant coconut. Then, the farmers introduced to intermediate where they passed their coconut later which is Samui coconut intermediary. Moreover, the intermediate explained to the process of coconut handling from receiving to sending out of the island. It is the best way to create the opportunities for the sample. To find the answer qualitative data collection tools used include documentary research, participatory observation, brainstorming, focus group and semi-structured in-depth interview checklist for intermediaries, hotels' chefs, purchasing officers, local restaurants, farmers and agriculture officers. Totally, there were 33 in-depth interviews which were conducted on July 2012 and June 2016.

The study revealed three categories of the culinary tourism coconuts supply chain in Samui, sources, intermediaries, and coconuts-users in cooking shown in Figures 2 in 3 patterns. First, the coconut farmers on the island sold large amounts of coconuts through middle-men near their farms. Sometimes, these middle-men directly picked up coconuts from the farms and made coconut milk and sold it to local restaurants. Secondly, the coconut farmers sold small amounts of their produce through the milk-producers near their farms. Sometimes, coconuts were sold along the side of the roads. After that the customers buy coconut to end users. And the last pattern, the coconut farmers, producers and customers are the same person, the restaurant's owner. The cook in this local restaurant cooks food from local owned ingredient directly serves to the tourists.

Qualitative data processing based on brainstorming and interviewing is used to capture the issues identified. Content analysis is the smallest unit of information. And the counting of words repeated in the result by finding the theme, so this analysis must be coded (Coding). The code definition of the content analysis is divided into two main stages. Designing a coding schedule

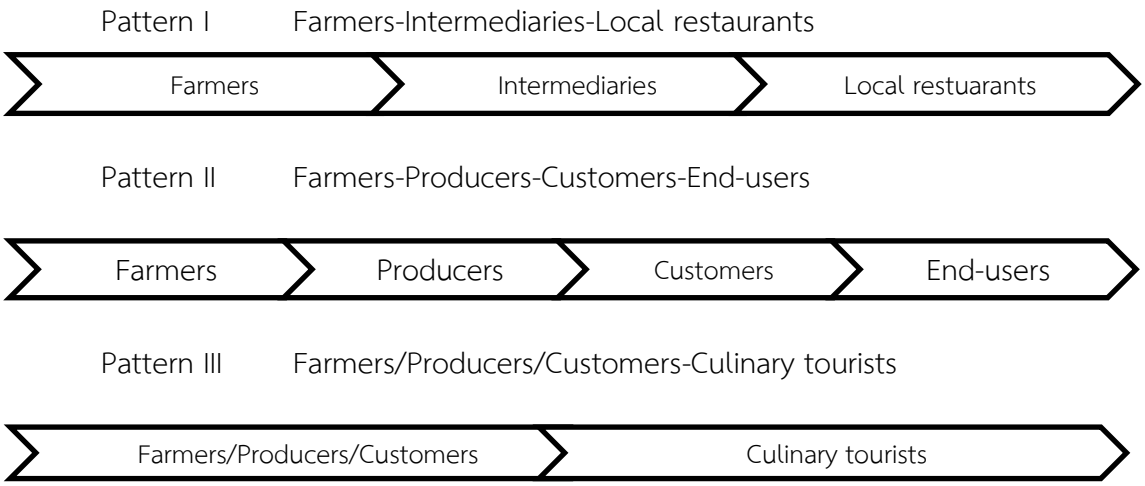

Figure 2 : Samui Island Coconut Supply Chain Three Patterns

and Designing a coding manual assisting by Nvivo11 program by reviewing the documentation that has helped guide this code design. To find the keywords or themes that interviewees have to say about the Samui's coconuts supply chain and the possible linkage of low-carbon culinary tourism on Samui Island using Samui Coconuts. The cookbook was designed, letters were formally coded using content analysis.

Findings

This research found that there are opportunities to reduce carbon emission in food management for Samui Island from low carbon menu by Samui chefs. The Samui's coconut cookbook was designed to reference to let interesting chefs use as guidelines for designing their Samui low carbon menu. And the research practiced the sample workshop for creating Samui Island touristic dishes that shown Samui Island identity by employing local Samui's coconuts. It was so called "Samui Risotto" which was applied from two Samui local dishes: Wai Khuo-dried octopus coconut curry-and Khao Mun-steamed rice mixed with coconut milk. They were cooked as the traditional way. After they finished cooking, they were mixed together. Then, they became Samui Risotto, finally. From this experiment, this menu can preserve the Samui people's traditional ways of life which connected with coconut. Then the coconut will be used more in the hotel and restaurants, the Samui farmers will turn to plant more coconut to supply for local hospitality industry.

Moreover, this research discovered the criteria for Samui Low Carbon menus and there was two chefs design low carbon menu based on Samui coconuts in the hotel's restaurants by using these criteria listed in Table 1.

The observation was used to collect the low carbon situation in the hotels by kitchen's restaurants and hotel visits as described in Table 2.

Table 1 : Samui Low Carbon Menus Criteria

The Criteria	Carbon Reduction
- Samui traditional local recipe - Distance of ingredients' sources (The nearer, the better, within 10km) - Mode of ingredients' transportation (Avoid air transportation mode) - Seasonal ingredients - Energy-efficient of ingredients storage - Meat usage (Avoid beef) - Energy sources of preparation (eg. Biogas, Solar) - Energy-efficient in cooking - Avoid aluminum foil usage at all process - Avoid plastic usage at all process - The food story-telling concern low-carbon menu - Presentation simple in Samui identity - Single-use packaging - Food waste management	-Use the island ingredients -Avoid consumption of outside ingredients -Reduce air transportation -Reduce energy consumption in storage -Reduce carbon footprint from livestock -Use renewable energy sources -Reduce energy consumption -Reduce carbon emission and waste -Reduce solid waste -Acknowledge the carbon emission information -Reduce solid waste from decorations -Reduce solid waste -Reduce waste, reuse and recycle

Source: Compiled by authors for this study

Table 2 : Restaurants and hotel's observation

Pictures	Observations
	The burning of coconut shell made high carbon emission to the environment at the intermediary place.
	The grilling by charcoal made high carbon emission to the environment at the local restaurants.
	The coconut recycling products were made and used in hotel to make tourist feel sense of place of Samui Island.
 Executive Chef: Renaissance     	The food miles concept applied in Renaissance, Koh Samui by planting frequent-used-Thai vegetables.

Pictures	Observations
 Executive Chef: Nora Buri Resort & Spa   	The food waste separation applied in the hotels kitchen at Samui Island.

Source: Compiled by authors for this study

Discussion

The analysis supported theoretical assumption that provided a strong link between Samui's coconuts and culinary tourism in term of sustainability, obviously shown in Figure 3.

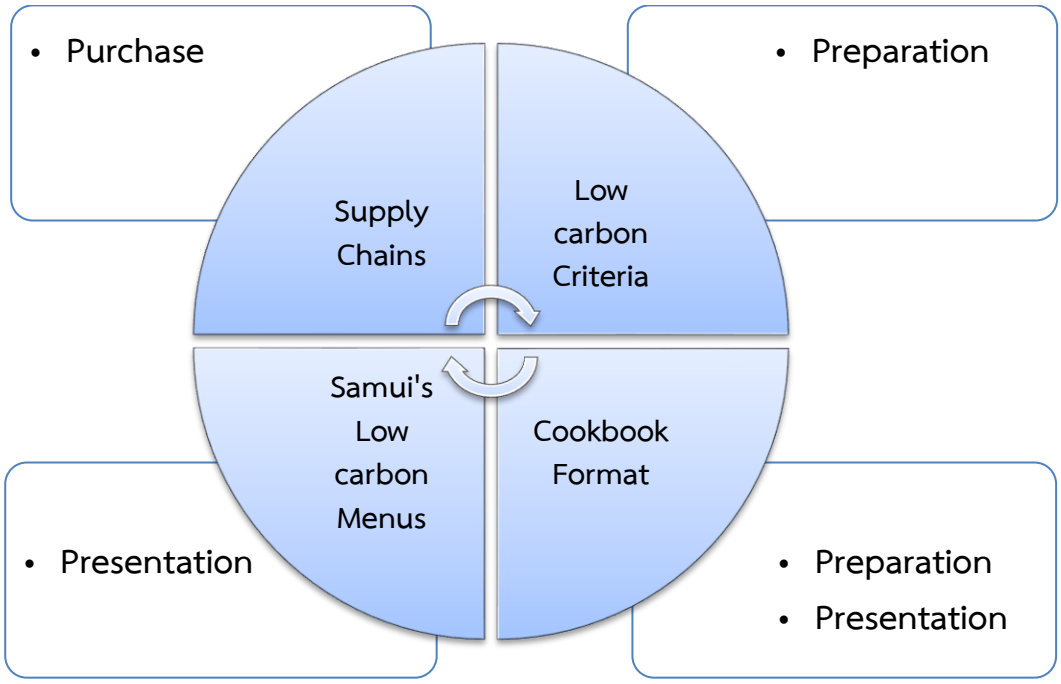

Figure 3 : The research findings

This research will offer the opportunities to link with agriculture and tourism using Samui coconuts. Not only the economic benefit but also it benefits to the social dimension in generating the coconut plant more in the island because coconut has been in ways of life and image of the island too. The finding shows there is a source of Samui's coconut after supply chain study. If the island can link coconut with the tourism, the coconut will not be extinct anymore. And it returns income from tourism into the community soon. Compared to 3Ps, the process is in purchase dimension. While the studying, it found that the facilitators and barriers to purchasing local agricultural products still have a gap. If the restaurants, chefs and farmers, intermediaries can work with coconut in term of low carbon to make the food in saving the environment. And the preparation process will be more efficient low carbon criteria. Then, the cookbook was designed. The low-carbon culinary menu format can be the guideline in reducing carbon into culinary tourism in all tourism destinations that will apply the format. Then, various co-created Samui's coconuts-based menus have been generated in term of the last P: presentation.

This study applied the theory of low carbon in food management using 3P's. The research findings were different to previous literature review based on the research area. The ingredients applied in the referred literature was in the States example, in this research employed the local ingredients. But it has yet based on the low carbon emission concept to make destination turn to sustainability through culinary tourism with local agricultural products.

According to 3Ps, the responsible department or Chefs may work in purchasing as little as possible in vegetables grown in heated greenhouses, foods involving air transport, specific species, such as giant, king and tiger prawns, lobster, imported beef and aluminum foil. Buy less seasonal foods out of their season. Buy more locally produced foods. Secondly, in the preparation process, Chefs should consider using energy from renewable sources, using more energy-efficient cooking routines. Put dishes on the menu that use less meat and more vegetables which will help to buy the local farmers as well. Plan purchases to avoid waste and separate food waste from general waste. Finally, for presentation, always present at least one attractive vegetarian alternative. Train staff to recommend less carbon-intensive dishes. And Chefs may avoid single-use packaging.

Also, the Samui's coconuts low carbon opportunities recommendations are proposed according to 3Ps: purchase, prepare and presented as in Table 3.

Table 3 : '3Ps' Samui Coconuts Low-carbon Recommendations

3Ps	Recommendations
Purchases	- Purchase Samui's coconuts from local farmers - Purchase Samui's coconuts from nearest local market - Avoid stocking - Stock management
Preparation	- Avoid using coconut milk box - Apply renewable energy - Avoid grilling - Avoid energy consume as less as you can - Separate food waste - Recycling food waste into usable form or renewable energy
Presentation	- Present with edible decoration - Educate staff to recommend low carbon menus - Train staff in story-telling concerning Samui's coconuts and low carbon menus

Source: Compiled by authors for this study

This research findings studied based on Gössling et al. (2011) theory and applied in coconut the best local ingredients in the past in Samui Island compared to Gössling et al. (2011). Gössling et al. (2011) studied the scientific number to calculate the carbon emission each main ingredients in Western recipes during the process in cooking and depicted the international concept of low carbon food management while this study only emphasis on Samui's Hotel kitchen. The research findings are same as Lee & Slocum (2015) even it's in different industry, who studied the application to use local food in the Meeting Industry. There are the same useful to apply local food to make green idea and low carbon reduction idea. Moreover, the trust and the relationship among local food network in Samui Island is weakness as case study stated in Boesen et al. (2017) and Roy et al. (2017). In Samui Island, hotel are afraid of inconsistency of the ingredients either quality or quantity. Tourist experiences encouraged to make more value creation in supply chain in service industry as same as Bjork and Kauppinen-Raisanen (2016) and Thomas-Francois (2017) researches.

Recommendation

1. For tourism policymakers; this low-carbon concept should be aware of all stakeholders in tourism and hospitality industry to make them highly pay attention to the environment to make tourism more sustainable in the area.

2. For tourism business sectors; these menus should be applied and spread over in others hotels restaurants and local restaurants.

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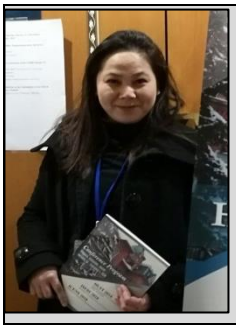

Natthakan Pruksorranan, Master of Arts (Tourism Management), Assumption University, Doctor of Philosophy (Hospitality and Tourism Management), Assumption University, Lecturer of Hotel and Tourism Department, Burapha Business School, Burapha University.

Dr. Adarsh Batra, Doctor of Philosophy (Tourism), Kurukshetra University, India, Program Director Master of Business Administration in Tourism Management and Doctor of Philosophy in Hospitality and Tourism Management programs, Assumption University.