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Exploring Orchard Tourism through Products, Services, Activities, and Functional Models: A Case Study in the Tohoku Region, Japan

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Abstract

This study examines the range of products, services, and activities offered by tourist orchards in the Tohoku Region of Japan and identifies the functional models used within these orchards. A qualitative approach was adopted, using data triangulation from both primary and secondary sources. Primary data were collected through on-site observations and semi-structured interviews with representatives from thirteen local tourism orchards. Secondary data were obtained from academic articles, textbooks, and official websites. Convenience sampling was used to select the 13 orchards based on their provision of Pick-Your-Own activities, bilingual websites, and active online promotion. The findings show that all orchards in the study provide fresh seasonal fruits and offer visitors hands-on harvesting and tasting experiences. Some orchards also sell processed products, operate farm shops, produce wines, and host a variety of additional activities. The study adds new elements to existing literature - such as "relaxing in a leisure orchard area" and "home delivery" - which broaden the understanding of orchard-based tourism services. The orchards can be grouped into four interconnected functional models: 1) the Pick-Your-Own Model (PYO) combined with the Rural Landscape Model (RLM), 2) the PYO combined with the Comprehensive Recreation Model (CRM), 3) the PYO combined with the Eco-Recreation Model (ERM), and 4) the integrated PYO–ERM–CRM model. Overall, the study helps fill gaps in current research on orchard tourism and offers practical functional models that can support improved orchard tourism management in Japan, Thailand, and other destinations worldwide.

Introduction

Japan, situated in East Asia, has only 12.64% of its land classified as arable. In 2021, the agriculture sector contributed approximately 4,792.70 billion JPY (Global Bioeconomy Study, 2024; Klein, 2023). In 2024, Japan ranked third globally on the Travel and Tourism Development Index with a score of 5.09 (World Economic Forum, 2024). The nation's GDP was 4,212.95 billion US dollars in 2023 (Trading Economics, 2024a), and the agricultural GDP increased to 5,312.10 billion

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JPY in 2022, up from 5,11 billion JPY in 2021 (Trading Economics, 2024b).

Among Japan's agricultural products, popular fruits such as Ichigo (Strawberry), Sakuranbo (Cherry), Melons, Suika (Watermelon), Momo (Peach), Ringo (Apple), Budo (Grape), Mikan (Mandarin Orange), Kiwi (Japanese Persimmon), and Nashi (Japanese Pear) are highly esteemed (Japan-guide, 2023). Despite Japan's renowned reputation for producing a variety of high-quality fruits, the agricultural industry faces significant challenges. These include the high cost of living (Mariko, 2022), and issues prevalent in agricultural sectors worldwide, such as the declining number of young orchard farmers (Jagdish, 2022; Terzuolo, 2020). Japan's agrotourism policy aims to sustain rural economies, preserve traditional agriculture, and offer unique tourist experiences. This policy promotes rural destinations, diversifies products, provides financial and training support, enhances online booking and promotion, and fosters collaboration between the government and the private sector. These efforts address depopulation, economic decline, cultural preservation, and sustainability (Mirzokulova Kumush Mirshakarovna, 2024; Chulalongkorn University, 2024).

In response, the concept of orchard tourism has emerged as a strategy to augment farmers' incomes by leveraging tourism revenues (Awasthi et al., 2013; Roopklom, 2019; Ekawati et al., 2021). Additionally, younger orchard farmers are increasingly engaging in activities beyond fruit cultivation, involving themselves in reshaping, planning, and managing their farms (or businesses) with innovative ideas, environmental awareness, and technologies to cater to both domestic and international visitors (United Nations World Tourism Organization [UNWTO], 2021; Zhao, 2022; Habito, 2023). This initiative seeks to foster heightened engagement and a deeper sense of stewardship among younger generations towards agricultural practices, while also enhancing visitor experiences through edutainment activities (Saili et al., 2020).

In recent years, despite numerous theories and case studies on agritourism (Barbieri, 2013; Liu et al., 2017; Lupi, 2017; Kowalska et al., 2017; Chase et al., 2018; Kim et al., 2019; Back et al., 2020; Van Winkle & Bueddefeld, 2021; Choo & Park, 2022), research specifically focused on orchard tourism remains limited. Some existing studies on orchard tourism explored the products, services, activities, management or functional models associated with this niche (Zhou & Chen, 2008; Albu & David, 2012; Na Songkhla & Somboonsuke, 2013; Awasthi et al., 2013; Khamung, 2015; Pitchayadejanant & Nakpathom, 2018; Roopklom, 2019).

Orchard tourism is a branch of agricultural and rural tourism that involves local farmers opening their orchards to tourists (Sznajder et al., 2009). This practice allows visitors to engage in authentic experiences while learning about various aspects of fruit cultivation such as harvesting, handling, and storage (Awasthi et al., 2013). Additionally, orchard tourism serves as an economic driver for rural communities, supporting local farmers (Curtis et al., 2017). Orchard tourism integrates recreational, educational, economic, and environmental benefits, offering an escape from urban life, hands-on farming experiences, insights into agriculture, and support for local economies and sustainability (Ekawati et al., 2021). Awasthi et al. (2013) noted that it operates as an agribusiness, with local farmers providing tours to educate visitors on fruit cultivation and processing. This form of tourism also creates new job opportunities and complements existing orchard enterprises (Srisomyong, 2010). It generates local revenue through tourism-related products and services, creating employment for locals and farmers (Rozman et al., 2009; Zhou & Chen, 2008; Albu & David, 2012; Hamzah et al., 2012). The revenue from tourism supports and diversifies agricultural enterprises, aiding rural development and reducing reliance on traditional farming (Roopklom, 2019). The economic impact of orchard tourism is notable, enhancing rural revenue and supporting farmers (Curtis et al., 2017). Regrettably, there is a scarcity of research specifically dedicated to orchard tourism. Furthermore, Mirzokulova Kumush Mirshakarovna (2024) highlighted the benefits of fruit tasting in orchard tourism, with fruit picking drawing global tourists to Japan (Japan-guide, 2024). However, these studies are considered outdated and fail to explore successful implementations observed in destinations such as the Tohoku region of Japan.

The Tohoku region is renowned for its fruit cultivation and fruit-picking activities, encompassing six prefectures: Akita, Aomori, Iwate, Yamagata, Miyagi, and Fukushima (Japan National Tourism Organization [JNTO], n.d.). This area is celebrated for its consistent production of high-quality and diverse fruits throughout the year, establishing itself as a leading producer of fruit in Japan, particularly excelling in the domestic production of apples, cherries, and European pears (Japan Fruits, n.d.). Furthermore, each prefecture within the Tohoku region offers notable insights into its orchard products.

For instance, Yamagata is prominent for its cherries, constituting approximately 70% of Japan's total domestic production volume (Tohoku Tourism Promotion Organization, 2019). Iwate is renowned as a premier location for strawberry picking, featuring five distinct varieties, including the rare white type (Fun Japan Communications, 2021). Fukushima, previously subject to agricultural product bans due to radiation concerns following a nuclear power accident (Takebayashi et al., 2020, has now earned appellations such as "the Fruit Kingdom of Japan" (All Nippon Airways, n.d.). This region has also garnered acclaim as a favored destination for both domestic and international tourists (Kyodo News, 2018; Japan National Tourism Organization [JNTO, 2022). All these factors contribute to the Tohoku region emerging as a valuable geographic area for orchard tourism. Regrettably, there is a dearth of research assessing orchard tourism products, services, activities, and functional models in this region.

Objectives

This study aims to investigate the current offerings of products, services, and activities at orchard farms in Tohoku, Japan. Additionally, it seeks to explore the functional models of orchard tourism applied in these farms.

Conceptual Framework

The conceptual framework of this research aims to explore orchard tourism through successful implementations at farms that attract both local and international visitors in the Tohoku region, Japan. This investigation encompasses the examination of products, services, activities, and functional models within orchard tourism farms. The assessment of products, services, and activities involved rigorous analysis of collected data, employing theoretical frameworks introduced by Awasthi et al. (2013), and Pitchayadejanant & Nakpathom (2018). Concurrently, the theoretical framework advanced by Zhou & Chen (2008), incorporating models such as the Pick-Your-Own Model, Farm-to-Table Model, and Agro-Entertainment Model, was utilized to explore the functional models in this study.

Research Methodology

1. Population and Samples

Fridlund & Hildingh (2000) noted that the sample size in qualitative studies typically ranges from 1 to 30 informants. Additionally, Guest et al. (2006) observed that data saturation, often evidenced by consistent data patterns, typically occurs within the first 12 informants. Consequently, this study collected data from thirteen orchard farms. Thirteen tourist orchards located across the Tohoku Region—specifically, Aomori (two orchards), Iwate (three orchards), Yamagata (one orchard), Miyagi (four orchards), and Fukushima (three orchards)—were comprehensively surveyed. The orchards were selected based on three key criteria: engagement in core orchard tourism activities such as "Pick-Your-Own," provision of farm information on bilingual websites (in both English and Japanese), and active promotion of their offerings through prominent online platforms, including TripAdvisor, Thingstodopost.org, Fukushima City Tourist Information, Japan-guide.com, and Japan Fruits: The Way of Japan. Furthermore, convenience sampling was used for its efficiency and cost-effectiveness. The key informants were either the owners of these tourist orchards or their designated representatives.

2. Research Instrument

The research employs site observations and in-depth interviews, utilizing semi-structured and open-ended questioning techniques to gather comprehensive information. This approach achieves a nuanced balance between flexibility and structure during interviews, allowing for detailed and unrestrained responses from participants. The interview questions were formulated based on the literature review to ensure alignment with the research objectives (Patton, 1990).

3. Data Collection

This approach facilitated in-depth exploration and interpretation of qualitative data obtained from key informants, either the owners of these tourist orchards or their designated representatives, elucidating their perspectives on various contexts (Oruh et al., 2021). A triangulation approach was utilized in data collection, incorporating primary data gathered through site observations and in-depth interviews, as well as secondary data obtained from a review of relevant literatures.

The primary data was predominantly obtained through two periods of site observation and in-depth interviews with semi-structured and open-ended questions. Photographs were taken to document significant products, services, activities, and essential information, thereby providing a visual dimension to the dataset. Due to the seasonal nature of fruit harvesting in Japan, which occurs at various times throughout the year and involves diverse fruit types, the study included

two periods of site observation to ensure thorough comprehension over the course of the research grant. These visits served the dual purpose of gathering firsthand, real-time data and facilitating a more effective analysis of the orchard tourism landscape.

In addition, an extensive review of diverse relevant literature was conducted as a secondary data source for the research to conduct grounded theory research, explore deep insights, and address the gaps in up-to-date literature (Chutiphongdech & Vongsaroj, 2022). The secondary resources included a variety of materials such as articles, textbooks, and official websites within the framework of the research inquiry, covering topics related to orchard tourism products, services, activities, and functional models.

4. Data Analysis

Content analysis is a reliable research method that offers a systematic and objective approach to derive valid interpretations from various types of written documents (Berg, 2001), site observations (Eastwood et al., 2011), and in-depth interview data (Wann-Hansson et al., 2005). Consequently, this study employed content analysis for data interpretation. The collected data, which included detailed information from primary and secondary sources such as relevant literature, site observations, and in-depth interviews with orchard owners or designated staff, was systematically coded, interpreted, and analyzed to address each research objective.

Results

Orchard Tourism Products, Services, and Activities

Orchard tourism merges fruit production with diverse tourism services and activities linking agriculture and tourism (Albu & David, 2012). Tourism Authority of Thailand [TAT] (2023) noted that orchards offer more than seasonal fruits, activities, and hospitality; they also provide scenic views, high-quality produce, and cultural experiences. Visitors can pick fruit directly from trees, learn about different fruit varieties, and understand orchard management, enriching their knowledge of local agriculture Suhartanto et al., 2020 and Sznajder et al., 2009 highlighted that orchard tourism includes activities like observing production, processing, participating in farming, educational tours, and interacting with animals and nature. These activities engage the senses, allowing visitors to enjoy vibrant fruit colors, scents, and flavors.

Kastenholz, et al. (2012) and Agapito et al. (2013) emphasized that sensory experiences, especially taste, are crucial to memorable tourism encounters. Fruit tasting deepens tourists' connection to agricultural landscapes, enhances appreciation for regional flavors, and supports local culture, agro-tourism, and biodiversity conservation (Sangkapitux, 2016).

Awasthi et al. (2013) identified key components of orchard tourism as including fresh fruits, processed products, wine, agricultural shops, and activities such as fruit picking, farm tours, tastings, and insights into cultivation and harvesting. Similarly, Pitchayadejanant & Nakpathom (2018) outlined thirteen activities based on the TISTR framework: planting, learning product transformation, fruit reaping and tasting, walking, biking in the orchard, attending festivals, feeding animals, homestays, learning agricultural practices, understanding farmers' lifestyles, purchasing souvenirs, acquiring saplings or seeds, and engaging in business contacts.

The study examined thirteen orchard tourism farms in the research area, meticulously evaluating their products, services, and activities within the theoretical frameworks proposed by Awasthi et al. (2013), and Pitchayadejanant & Nakpathom (2018). These establishments are strategically located across multiple prefectures within the Tohoku region, specifically Aomori (n = 2), Iwate (n = 3), Yamagata (n = 1), Miyagi (n = 4), and Fukushima (n = 3) Prefectures. Table 1 provides a detailed overview of the products, services, and activities offered by each of the thirteen orchard tourism sites.

Table 1 Orchards Tourism Products and Services in Tohoku Area, Japan

Location	Tourism Name Orchards	Products	Services and Activities
Aomori Prefecture	A1	- Fresh fruit (strawberry and cherry)	- Fruits reaping and tasting - Walking in the orchard
	A2	- Fresh fruits (cherry, blueberry, peach, pear, grapes, and apples)	- Fruits reaping and tasting
Iwate Prefecture	I1	- Fresh fruits (strawberry and tomato) - Processed agricultural products (ice cream and souvenirs) - Agricultural shops (flowers and plants)	- Fruit reaping and tasting (only strawberry) - Walking in the orchard - Purchasing souvenirs - Feeding animal (Alpaca) - Tasting sessions - Relaxing in leisure orchard area
	I2	- Fresh fruits (apple, peach, grapes, pear, prune, plum, and persimmon)	- Fruits reaping and tasting - Learning agricultural practices - Home delivery service
	I3	- Fresh fruit (grapes) - Wine (wine)	- Fruits reaping and tasting - Purchasing souvenirs - Tasting sessions - Attending festival
Yamakata Prefecture	Y1	- Fresh fruits (cherry, pear, grapes, watermelon, melon, and strawberry) - Processed agricultural products (Food and beverages)	- Fruits reaping and tasting - Purchasing souvenir - Tasting sessions - Learning agricultural practices - Home delivery service - Relaxing in leisure orchard area
Miyagi Prefecture	M1	- Fresh fruit (blueberry) - Processed agricultural products (jam, juice and ice cream)	- Fruits reaping and tasting - Purchasing souvenir - Tasting sessions - Relaxing in leisure orchard area
	M2	- Fresh fruits (apple, peach and pear)	- Fruits reaping and tasting - Walking in the orchard - Purchasing souvenir - Relaxing in leisure orchard area
	M3	- Fresh fruits (apple, grapes, pears, blueberry, figs and tomato) - Processed agricultural product (jam and ice cream)	- Fruits reaping and tasting - Purchasing souvenir - Tasting sessions - Relaxing in leisure orchard area
	M4	- Fresh fruits (apple, pear, blueberry, grapes, figs, kiwi, strawberry and raspberry) - Processed agricultural products (jam, juice and ice cream)	- Fruits reaping and tasting - Walking in the orchard - Purchasing souvenir - Tasting sessions
Fukushima Prefecture	F1	- Fresh fruits (peach, cherry, apple, pear and grapes) - Processed agricultural products (ice cream)	- Fruits reaping and tasting - Purchasing souvenir - Tasting sessions - Relaxing in leisure orchard area - Gaining insights into the cultivation and harvesting processes
	F2	- Fresh fruits (cherry, persimmon, grape, peach, pear and apple) - Processed agricultural products (juice)	- Fruits reaping and tasting - Walking in the orchard - Purchasing souvenir - Tasting sessions - Relaxing in leisure orchard area
	F3	- Fresh fruits (cherry, peach, pear and apple)	- Fruits reaping and tasting - Walking in the orchard - Purchasing souvenir

A notable commonality among all among all tourism orchards (100%) is the provision of seasonally fresh fruits, including cherries, blueberries, peaches, prunes, plums, persimmons, watermelons, melons, pears, grapes, figs, tomatoes, kiwis, raspberries, and apples. This consumer-centric approach allows tourists to actively engage in selecting and enjoying fresh fruits within the farms. Some orchards offer only a singular type of fresh fruit for tourists, while others provide up to seven distinct varieties for their visitors. Moreover, within the cohort of these 13 orchard farms, seven (Y1, M1, M3, M4, F1, F2 = 53.85%) additionally offer visitors

a diverse array of processed agricultural products, such as food items, beverages, jams, juices, ice creams, as well as floral and botanical specimens. Within the ambit of this study, it is noteworthy that, a singular orchard farm (I1=7.69%) incorporated an agricultural shop specializing in the sale of floral and botanical specimens. Additionally, one orchard farm (I3=7.69%) focuses on wine production as its primary agricultural output derived from grapes.

Focusing on the services and activities within these orchard farms, the investigation revealed that each of the thirteen orchard farms (100%) provides tourists with the opportunity to engage in fruit "Reaping and tasting" activities. Among the surveyed orchard farms, it was observed that 10 establishments (I1, I3, Y1, M1, M2, M3, M4, F1, F2, F3 = 76.92%) facilitated a "Purchase souvenirs" activity for their tourists, while 8 farms (I1, I3, Y1, M1, M3, M4, F1, F2 = 61.53%) hosted "Tasting sessions". Additionally, 7 farms (A1, A2, I1, M2, M4, F2, F3 = 53.85%) provided the opportunity for tourists to engage in "Walking in the orchard", 7 farms (I1, Y1, M1, M2, M3,F2 = 46.15%) facilitated a "Relaxing in leisure orchards area", 2 farms (I2, Y1 = 15.38%) offered programs for "Learning agricultural practices", 2 farms (I2, Y1 = 15.38%) provided "Home delivery", one farm (I1 = 7.69%) allowed for "Feeding animals", another (I3 = 7.69%) offered participation in an "Attending festival", and finally, 1 farm (F1 = 7.69%) provided a platform for tourists to "Gain insights into the cultivation and harvesting process".

Remarkably, within the purview of this study and in alignment with the theoretical frameworks proposed by Awasthi et al. (2013) and Pitchayadejanant & Nakpathom (2018), two new activities were discerned. The results revealed that six farms (46.15%) offer the activity termed "Relaxing in a leisure orchard area" to their visitors, whereas two farms (15.38%) provide the service of "Home delivery" for enhanced customer convenience.

Functional model of orchard tourism in Tohoku area, Japan

Orchard tourism models delineate the delivery of products, services, and activities to visitors, varying by location, orchard type, and audience (Pehin Dato Musa & Chin, 2022). A fundamental model is the "Pick-Your-Own Model" (PYO), where visitors pick fruit directly from trees, providing an interactive experience. Research by Specca, et al. (2022) indicates that the PYO model effectively attracts visitors and benefits local communities.

Zhou & Chen (2008) identified six models of Chinese tourist orchards:

1) Traditional Management Model (TMM): Offers conventional fruit harvesting.

2) Rural Landscape Model (RLM): Focuses on scenic environments.

3) Theme Park Model (TPM): Includes thematic activities like juicing demonstrations and fruit science education.

4) Eco-Recreation Model (ERM): Emphasizes sustainability and outdoor recreation.

5) Tech-Education Model (TEM): Combines technology and education in farming practices.

6) Comprehensive Recreation Model (CRM): Combines technology and outdoor recreation, which provides a mix of orchard experiences and leisure activities.

Additionally, some models incorporate the "Agro-Entertainment Model" (AEM), featuring activities such as hayrides and petting zoos to appeal to a broader audience (Sznajder et al., 2009; Shang & Zhu, 2022). Suhartanto et al. (2020) demonstrated that agro-entertainment enhances visitor satisfaction and recommendations. The "Farm-to-Table Model" (FTM) highlights fresh farm produce and connects visitors with food activities. This model involves farm tours, culinary workshops, and tastings, allowing visitors to learn about the orchard's practices and reconnect with the cultural roots of food (Fanelli, 2019).

Pehin Dato Musa & Chin (2022) found that the FTM positively influences visitors' perceptions of the food system and supports local agriculture. This model not only enhances the visitor experience but also fosters a deeper connection between consumers and local food producers, promoting sustainable agricultural practices.

In the comprehensive framework of this research, the theoretical framework proposed by Zhou & Chen (2008) was utilized, which delineates six tourist orchard functional models: The Traditional Management Model (TMM), The Rural Landscape Model (RLM), The Theme Park Model (TPM), The Eco-Recreation Model (ERM), The Tech-Education Model (TEM), and The Comprehensive Recreation Model (CRM). This framework was further enhanced by incorporating the Pick-Your-Own Model (PYO), Farm-to-Table Model (FTM), and Argo-Entertainment Model (AEM).

Table 2 Tourist Orchard Functional Models in Tohoku Area, Japan

Tourism Orchards Name	PYO	FTM	AEM	TMM	RLM	TPM	ERM	TEM	CRM
A1	✓				✓				
A2	✓				✓				
I1	✓								✓
I2	✓				✓				
I3	✓								✓
Y1	✓						✓		
M1	✓						✓		✓
M2	✓						✓		
M3	✓						✓		✓
M4	✓								✓
F1	✓						✓		✓
F2	✓						✓		
F3	✓				✓				

The results revealed that within the scope of the study in the Tohoku region, all tourist orchards (100%) implemented the Pick-Your-Own Model (PYO). Nonetheless, the findings also indicated their simultaneous involvement with other functional models. This multifaceted engagement can be classified into four interrelated functional groups of models.

Table 3 Four Interrelated Functional Groups of Models

Groups	Concepts	Products/Services/ Activities
Group 1: A1, A2, I2, and F3 Pick-Your-Own Model combined with and the Rural Landscape Model	Visitors can harvest fresh fruits while enjoying the artisanal charm and scenic rural landscapes of the orchards.	- Fruit reaping and tasting - Walking in the orchard Options: - Learning agricultural practices - Home delivery service
Group 2: I1, I3, and M4 Pick-Your-Own Model combined with the Comprehensive Recreation Model	Visitors can enjoy fresh fruit harvesting alongside recreational activities and facilities, offering a well-rounded orchard experience.	- Fruit reaping and tasting - Walking in the orchard - Purchasing souvenirs Options: - Feeding animals - Attending festivals - Tasting sessions - Relaxing in leisure orchard area
Group 3: Y1, F2, and M2 Pick-Your-Own Model combined with the Eco- Recreation Model.	Visitors can harvest and taste fresh fruits while enjoying outdoor eco-recreational activities in a peaceful orchard setting.	- Fruit reaping and tasting - Purchasing souvenirs - Relaxing in leisure orchard area Options: - Tasting sessions - Learning agriculture practices - Home delivery service - Walking in the orchard
Group 4: M1, M3, and F1 A combination of the Pick- Your-Own Model, the Eco- Recreation Model, and the Comprehensive Recreation Model	Visitors can harvest and taste fresh fruit, enjoy eco- recreational activities, and access various facilities for a comprehensive orchard experience.	- Fruit reaping and tasting - Purchasing souvenirs - Relaxing in leisure orchard area - Tasting sessions Options: - Gaining insights into the cultivation and harvesting processes

Group 1: A1, A2, I2, and F3 (PYO combined with RLM)

Four orchard farms (A1, A2, I2, F3 = 30.77%) are characterized by the confluence of the Pick-Your-Own Model and the Rural Landscape Model. Within this paradigm, tourists are not only presented with the opportunity to harvest and consume fresh fruits, but they are also afforded the experience of appreciating the artisanal and aesthetically pleasing landscapes intrinsic to the orchard environment through leisurely walks.

Figure 1 Rural Landscape of Tourism Orchards in Tohoku Region, Japan
Source: The researchers during visiting

Group 2: I1, I3, and M4 (PYO combined with CRM)

Three orchard farms (I1, I3, M4 = 23.07%) within this cluster exhibit the confluence of the Pick-Your-Own Model and the Comprehensive Recreation Model. Tourists in these orchard farms not only engage in the harvesting and consumption of fresh fruits but also seamlessly integrate orchard experiences with associated recreational activities, comprehensive facilities, and souvenir shopping. This approach embodies a holistic and multifaceted strategy for visitor engagement.

Figure 2 Available Fresh Fruits for Picking in Tourism Orchards; Tohoku Region, Japan
Source: The researchers during visiting

Group 3: Y1, F2, and M2 (PYO combined with ERM)

Three tourism orchards (Y1, M2, F2 = 23.07%) implemented the Pick-Your-Own Model in conjunction with the Eco-Recreation Model. This implies that visitors to these orchard farms have the opportunity not only to partake in the harvesting and tasting of fresh fruits but also to relax in designated leisure areas and actively participate in outdoor recreational activities amid the serene orchard environment.

Figure 3 Outdoor Facilities in Tourism Orchards in Tohoku Region, Japan
Source: The researchers during visiting

Group 4: M1, M3, and F1 (Integration of PYO, ERM, and CRM)

Three orchard farms (M1, M3, F1 = 23.07%) implemented a combination of the Pick-Your-Own Model, the Eco-Recreation Model, and the Comprehensive Recreation Model. Consequently, patrons at these orchard farms have the opportunity to partake in the harvesting and tasting of fresh fruit, participate in both indoor and outdoor recreational activities facilitated by comprehensive facilities within the orchard's ambient setting, and combine orchard experiences with associated leisure pursuits.

Figure 4 Souvenir Shops in Tourism Orchards in Tohoku Region, Japan
Source: The researchers during visiting

To sum up, the findings indicated that the orchard tourism farms in this study expanded upon the theoretical framework proposed by Zhou & Chen (2008). Firstly, all four groups of functional models demonstrated interrelations with the Pick-Your-Own Model, which serves as a foundational framework in orchard tourism. Secondly, the initial six functional models were found to potentially overlap with each other or with additional models. Thirdly, after enriching the six models of Zhou & Chen by integrating the Pick-Your-Own Model, Farm-to-Table Model, and Agro-Entertainment Model, the findings also showed that none (0%) of the thirteen orchard farms examined adopted the Traditional Management Model, Theme Park Model, Tech-Education Model, Farm-to-Table Model, or Agro-Entertainment Model.

Discussion

Products, Services, and Activities Discussion

Orchard tourism revolves around the availability of seasonal fresh fruits, which are obtainable during specific periods rather than throughout the year. Consequently, orchards often process raw materials into various agricultural products as a primary strategy. Two orchards situated near urban areas with diverse fruit tree plantations attract tourists year-round. To ensure sustained benefits and enhance visitor experiences, orchards should focus on cultivating seasonal fruits and diversifying their agricultural offerings. This strategy not only fortifies the relationship between orchards, visitors, and the distinctive local environment (TAT, 2023; Suhartanto et al., 2020; Kastenholz et al., 2012; Agapito et al., 2013) but also underscores the significance of expanding market reach. For instance, one orchard in Iwate Prefecture opened a shop in a city department store to make their products and souvenirs more available. These findings corroborate Wainwright's study (Wainwright, 2015), which emphasizes that diversification in product offerings fosters connections between orchards and visitors while boosting local business revenue.

Fruit harvesting and tasting are essential activities at leading orchard tourism sites, where efforts are concentrated on enhancing visitor experiences through additional amenities. Many of these sites feature souvenir shops, opportunities to sample fresh and processed agricultural products, and guided orchard tours to boost visitor satisfaction. Ekawati et al. (2021) endorse these approaches, advocating for orchard agro-tourism strategies that prioritize service quality across all visitor interactions and expand outdoor infrastructure to attract a broader audience. As orchard tourism gains prominence, managing service quality necessitates careful attention to both product quality and visitor engagement to ensure overall satisfaction. These initiatives can economically benefit local farmers, promote sustainability, and preserve cultural heritage (Sznajder et al., 2009; Albu & David, 2012; Sangkapitux, 2016).

Additionally, interactions between orchardists and tourists often involve direct, close contact with orchard operations and growers, fostering intimate relationships. These findings resonate with Awasthi et al. (2013); Kastenholz et al. (2012); and Agapito et al. (2013), who emphasize similar themes. Furthermore, to protect planting areas, orchard owners establish dedicated harvesting stations. Some orchardists require large tour groups to schedule visits at least a month in advance to ensure adequate time for fruit preparation and arranging fruit-based products, illustrating a strategic effort to enhance visitor service quality.

The findings also revealed that the products, services, and activities within the orchard farms examined in this study include offerings such as "Relaxing in leisure orchard area" and "Home delivery service," which are not explicitly addressed in the theoretical frameworks of Awasthi et al. (2013) and Pitchayadejanant & Nakpathom (2018). Approximately half of the orchard farms analyzed in this research, provide designated relaxing zones equipped with tables and chairs within the orchard premises, aiming to enhance the leisure experiences of tourists following the activities of reaping and tasting fresh fruits. Orchard tourism offers not only fresh fruit products but also unique and authentic experiences, such as the opportunity to consume freshly harvested fruits in their natural environment. This aspect of sensory engagement in tourism experiences is underscored by the studies of Kastenholz et al. (2012); Agapito et al. (2013). Additionally, two orchard farms included in this study offered a home delivery service, catering to tourists wishing to purchase products for friends and family or preferring not to transport items themselves. Hence, services such as home delivery represent an effective avenue to enhance service quality and boost local revenue. This observation is corroborated by Wainwright's research in 2015 (Wainwright, 2015).

In light of these findings, this study recommends expanding the scope of existing literature on orchard tourism products, services, and activities by incorporating

"Relaxation in a leisure orchard area" and "Home delivery services" to align with global trends. Furthermore, it is suggested that orchard tourism operators, whether existing or prospective, integrate these activities into their operations to enhance the authentic experiences of their visitors and adopt additional service channels such as home delivery to cater to their guests.

Functional Models Discussion

Given that the primary role and function of orchard tourism is the Pick-Your-Own activity (Awasthi et al., 2013; Pitchayadejanant & Nakpathom, 2018; Roopklom, 2019), it is unsurprising that all thirteen farms (100%) examined in this study employ this model. This finding underscores the necessity of integrating references to the Pick-Your-Own model within functional frameworks of orchard tourism. Furthermore, the PYO Model is acknowledged for its potential to address contemporary challenges faced by orchard farmers, such as enhancing agricultural income through tourism revenues (Awasthi et al., 2013; Roopklom, 2019; Ekawati et al., 2021) and attracting younger generations to farming (UNWTO, 2021; Zhao, 2022; Habito, 2023). By converting traditional fruit farms into orchard tourism destinations, farmers can leverage additional revenue streams from tourism and cultivate future local agriculturalists.

Secondly, building upon the initial recommendation to integrate the concept of PYO into every model as a fundamental aspect of orchard tourism, the study suggests that functional models within orchard tourism may exhibit overlaps with each other or across multiple frameworks. Insights from in-depth interviews reveal that the primary factors influencing the adoption of diverse models by orchard tourism farms include spatial constraints, available workforce, and financial resources. This discovery significantly enriches the orchard tourism literature by highlighting the potential for model overlaps. Additionally, it provides valuable insights that can inform the management strategies employed by orchard tourism farms.

In scenic landscapes, certain orchard tourism farms have adopted a combination of the Pick-Your-Own Model (PYO) and Rural Landscape Model (RLM). This strategic approach leverages natural beauty, offering guests a blend of scenic charm and various recreational activities. These farms are envisioned as peaceful retreats where visitors can relax and enjoy leisurely pursuits. Similar orchard styles resonate in regions like parts of Rajasthan and rural Punjab in India (Awasthi et al., 2013), enabling rural orchard farmers to capitalize on picturesque landscapes and diverse recreational offerings. Careful management of these landscapes is crucial.

Another effective strategy to enhance these farms is combining the Pick-Your-Own Model (PYO) with the Comprehensive Recreation Model (CRM). This approach includes offering agricultural shops, cafés, and a range of activities, such as walking tour in the farms, to enrich visitor experiences with fresh produce, restaurants, souvenirs, and coffee, aligning with studies by Van Winkle & Bueddefeld (2021) and Kastenholz et al. (2012). Therefore, diversifying recreational activities and amenities such as restrooms, dining options, and souvenir shops is essential for orchard tourism operators to improve visitor experiences of rural landscapes.

Moreover, integrating the Pick-Your-Own Model (PYO) with the Eco-Recreation Model (ERM) at orchard tourism farms underscores a commitment to environmental sustainability. This approach provides outdoor recreational opportunities amidst the orchard's serene ambiance, akin to practices observed internationally, such as at the Krishnaraja Saga Dam's north bank in India (Awasthi et al., 2013) and in Manitoba, Canada (Van Winkle & Bueddefeld, 2021). Establishing outdoor recreational areas can thus enhance the appeal of orchard tourism by offering authentic outdoor experiences like fruit picking and eating in a natural setting.

Based on the findings, it was noted that certain orchard tourism farms incorporate a triad of models (integration of PYO, ERM, and CRM) within their establishments, aiming to allure and actively engage tourists in immersive experiences. This observation is corroborated by the research conducted by Pehin Dato Musa and Chin (2022), which indicates that the assortment of orchard tourism models exemplifies diverse strategies orchards can employ to attract and engage visitors. This implies that orchard tourism farms have a significant opportunity to incorporate more effective models, thereby increasing their chances of attracting visitors. However, orchard tourism operators must also consider their own resources, including budgets and available space.

Finally, the absence of models such as Farm-to-Table, Agro-Entertainment, Traditional Management, Theme Park, or Tech-Education within orchard tourism farms indicates a potential gap. This observation underscores opportunities for enhancing operational activities within orchard tourism, both in the Tohoku

region and beyond. Orchard tourism farmers with the requisite resources and capacity may consider adopting these models to enhance the benefits derived from orchard tourism. Conversely, their absence may suggest that these particular functional models are not currently aligned with prevailing global contexts.

Conclusions

Amid increasing challenges faced by agricultural farmers, such as low income and a dwindling number of young orchard farmers, orchard tourism has emerged as a pivotal strategy to address these issues. Unlike traditional agricultural farms focused solely on fruit cultivation and sales, orchard tourism expands opportunities for value and revenue generation. As a subset of agritourism, orchard tourism offers an escape from urban life, allowing visitors to reconnect with nature, engage in agricultural activities, and enjoy the fruits of the land. Despite extensive research on agritourism, there is a noticeable lack of dedicated studies on orchard tourism. Existing research in this area is outdated and fails to explore successful examples such as those found in Japan. The selection of the Tohoku Region as the research study area was based on its renown as a primary producer of high-quality and diverse fruits throughout the year, thereby advancing the concept of orchard tourism farms for both local and international visitors. Therefore, this study aims to examine the current range of products, services, and activities available at orchard farms, as well as to explore the functional models of orchard tourism implemented in these farms located in Tohoku, Japan.

This study employed a qualitative approach, commencing with a review of existing literature on products, services, activities, and functional models within orchard tourism, considered as secondary data. Primary data was subsequently gathered through site observations and in-depth interviews, ensuring triangulation for enhanced accuracy. The research focused on orchard tourism farms in the Tohoku Region, Japan, involving a total of thirteen key informants comprising farm owners or designated personnel. Following data collection, content analysis was employed to analyze all gathered information.

The findings underscore that these orchard farms afford tourists the chance to participate in activities such as "reaping and tasting" seasonal fresh fruits. Several farms also provide visitors with processed agricultural products, agricultural shops, and wines. Within the surveyed orchard farms, it was noted that ten establishments facilitated a "purchase souvenirs" activity for their visitors, eight farms organized "tasting sessions," seven farms offered opportunities for "walking in the orchard," and "relaxing in leisure orchard areas," two farms provided programs for "learning agricultural practices," one farm allowed for "feeding animals," another presented the option of "attending festivals," and one farm offered a platform for tourists to "gain insights into the cultivation and harvesting process". Moreover, the results indicated that every tourist orchard adopted the Pick-Your-Own Model (PYO) as the fundamental concept of orchard tourism. However, the findings also revealed their concurrent utilization of other models. This diversified engagement can be categorized into four new groups:1) PYO combined with RLM, 2) PYO combined with CRM, 3) PYO combined with ERM and 4) Integration of PYO, ERM and CRM.

The research findings also revealed that offerings such as "Relaxing in leisure orchard area" and "Home delivery service," found in the orchard farms under study are not explicitly covered in the theoretical frameworks of Awasthi et al. (2013) or Pitchayadejanant & Nakpathom (2018). This study recommends expanding orchard tourism literature by including "Relaxation in a leisure orchard area" and "Home delivery services" to align with global trends. It also advises operators to incorporate these activities and services to enhance visitor experiences and broaden service channels. Moreover, in light of the theoretical framework proposed by Zhou & Chen (2008), and other models like the Pick-Your-Own Model (PYO), Farm-to-Table Model (FTM), and Argo-Entertainment Model (AEM), the study's findings revealed that orchard tourism farms expanded upon the theoretical framework in several ways. Firstly, all four groups of functional models demonstrated connections with the Pick-Your-Own Model, which serves as a fundamental framework in orchard tourism. Secondly, the initial six functional models were identified as potentially overlapping with each other or with additional models. Thirdly, after enhancing Zhou and Chen's six models by integrating the Pick-Your-Own Model, Farm-to-Table Model, and Agro-Entertainment Model, the research also indicated that none (0%) of the thirteen orchard farms examined had adopted the Traditional Management Model, Theme Park Model, Tech-Education Model, Farm-to-Table Model, or Agro-Entertainment Model. The absence of models like Farm-to-Table or Agro-Entertainment in orchard tourism suggests opportunities for growth but may reflect resource limitations or misalignment with global trends.

The outcomes of this study fill significant gaps in the outdated literature on orchard tourism concerning products, services, activities, and functional models observed in successful destinations such as Tohoku, Japan. Moreover, the findings from this research provide valuable insights for orchard farmers and stakeholders, both within Japan and globally, who face comparable circumstances and challenges, offering new perspectives and opportunities for knowledge acquisition.

Suggestions

To function as an economic catalyst for rural communities and support local farmers through tourism revenue, local governments must adopt orchard tourism policies. These policies should promote rural areas, diversify products, provide financial aid and training, enhance online systems, and foster private-sector partnerships. By doing so, they can establish the region as a leading orchard tourism destination, comparable to Tohoku, Japan.

Like any research endeavor, the current study has inherent limitations that can serve as important starting points for future research aimed at enhancing memorable experiences in orchard tourism.

Primarily, it is crucial to acknowledge that the data in this study mainly originated from the viewpoint of service providers. While valuable, this perspective may not encompass all stakeholders involved in managing orchard tourism in the area. Future research efforts would greatly benefit from incorporating data from visitors and other pertinent organizations, thereby providing a more thorough and inclusive comprehension of the diverse aspects of promoting and developing tourism orchards.

Secondly, the study was conducted during the peak season of orchard tourism to effectively implement the site observation instrument in real settings. However, the limited availability of time for conducting in-depth interviews with orchard tourism owners or their designated staff was a constraint. Additionally, the study focused on thirteen tourist orchards that have been successful in orchard tourism recently. Hence, future research should broaden its scope by including a larger number and diverse types of orchard tourism farms.

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