

RICE Journal

of Creative Entrepreneurship and Management



RICE

Rattanakosin International College of Creative Entrepreneurship, RMUTR

VOLUME 2 NUMBER 3
SEPTEMBER-DECEMBER 2021
ISSN 2730-2601
<https://ricejournal.rmutr.ac.th>

RJCM

RICE JOURNAL OF CREATIVE ENTREPRENEURSHIP
AND MANAGEMENT

Rattanakosin International College of Creative Entrepreneurship (RICE)
Rajamangala University of Technology Rattanakosin (RMUTR), Thailand

Volume 2, Number 3, September-December 2021

Published by:

Rattanakosin International College of Creative Entrepreneurship (RICE)
Rajamangala University of Technology Rattanakosin (RMUTR), Thailand

Editorial Office: Academic Division

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RICE Journal of Creative Entrepreneurship and Management (RJCM)
Rattanakosin International College of Creative Entrepreneurship (RICE)
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About Us

RJCM is an international journal for academics and scholars at the higher education level to communicate and share their viewpoints and academic work with fellow professionals in the areas of creative entrepreneurship and management as practiced in their fields of specializations in social sciences.

RJCM publishes three numbers per volume annually and welcomes contributors to submit their manuscript in January, May, and September of each year. We accept both academic and research papers in social sciences from contributors. The papers are double-blind peer-reviewed in each volume and published online-plus-print thrice a year.

The length of the unformatted manuscript in WORD can be 15-25 pages in length including references. The contents of the manuscript should include (1) a title with the author's name, affiliate, email address and telephone contact, (2) an abstract of 150 words with 3-5 keywords, (3) an introduction, (4) a rationale and background of the study, (5) research objectives, (6) research methodology, (7) data collection procedure, (8) data analysis, (9) results and discussion, (10) research limitation (if any), (11) conclusion, (12) the author's biography of about 50-80 words, (13) acknowledgement(s) (if any), (14) references, and (15) an appendix or appendices (if any).

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RICE Journal of Creative Entrepreneurship and Management (RJCM)
Rattanakosin International College of Creative Entrepreneurship (RICE)
Rajamangala University of Technology Rattanakosin (RMUTR)

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Note from Editors of *RJCM* Volume 2 Number 3

Dear *RJCM* Readers,

You are now with our third issue in Year 2 of *RICE Journal of Creative Entrepreneurship and Management (RJCM)*. This issue contains six articles in the areas of tourism, gastronomy, management regarding the issues of stress and work process, acculturation and learning organization.

In this issue, we have two papers in the area of tourism regarding customers' experience and adjustment in gastronomy services: "*Tourists' Satisfaction with Products, Services and Quality Development of Hot Spring Wellness Tourism*" (Article 1) and "*Promotion of Gastronomy Tourism in Thailand after the Covid-19 Pandemic*" (Article 2). We have two papers in management dealing with employees' stress and work process of agricultural yield: "*Stress Management at Workplace in Challenging Situations*" (Article 3) and "*Climate Change and Nam Dok Mai Mango Yield: A Process Management*" (Article 4). Two more papers deal with issues on acculturation as the public policy and learning organization transformation "*Acculturation and Life Satisfaction of Yi Villagers in China: A Survey Based on Different Yi Ethnic Branches*" (Article 5), and "*Learning Organization Development: A Case of the Armed Forces Academies Preparatory School*" (Article 6). These articles report interesting findings and innovations in the areas under study. This issue also carries a brief professional viewpoint on online learning for young learners during the Covid-19 lockdown period.

Our paper contributors in this third issue are researchers from universities in China and Thailand: Chongqing Technology and Business University, Chiang Mai University, Dhurakij Pundit University, Rajamangala University of Technology Rattanakosin, followed the Armed Forces Academies Preparatory School, and TMBThanachart Bank Public Company Limited.

The editors-in-chief hope that the research findings and innovations reported in these papers will be interesting to both researchers and practitioners in similar fields of study. The *RJCM* editorial team and the authors would appreciate our readers' comments about these articles, if possible. We always welcome contributions from those who may wish to be part of our *RJCM* network.

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Dear *RJCM* Readers,

The Covid-19 pandemic has been a cornerstone of a mankind history where things have never been this obscure, uncertain, and insecure, yet revealing. People do not know what is true, what to believe, and how they would have to adapt their worldviews and cope with things in their lives. Pseudoscience, conspiracy theories, fake news, are floated around in our information reception spans. For some, the Covid-19 phenomenon may need to be observed and explained by “reading-between-the-lines” as the social structures have become somewhat opaque and power holders have kind of restraining themselves from revealing the truth.

As such, the pandemic necessitates social theories to be retested empirically whether they still can explain, not to mention to predict, the social world. Undoubtedly, it has affected people from all walks of life, certainly including researchers and academics who have still continued with their work regardless of the limited channels of communication. The articles contributed to *RICE Journal of Creative Entrepreneurship and Management* in this hard time would help fill the voids between academics and communities concerned.

I feel much obliged to all the authors for contributing the betterment of their work to academic communities. Your research in different fields of management and creative entrepreneurship certainly help reexamine the world temporarily blurred with uncertainties at the time of the pandemic.

Always with my best wishes for readers and paper contributors of *RJCM*.

ISSN 2730-2601

RICE Journal of Creative Entrepreneurship and Management, Vol.2, No.3, pp. 1-22,
September-December 2021

© 2021 Rajamangala University of Technology Rattanakosin, Thailand

doi: 10.14456/rjcm.2021.34

Received 25.08.21/ Revised 4.09.21/ Accepted 14.09.21

Tourists' Satisfaction with Products, Services and Quality Development of Hot Spring Wellness Tourism

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Abstract

Geothermal springs create the main tourism resource, offering remarkable sceneries, recreation facilities, and recognized value in treatments for health and wellness. The rapid growth of wellness tourism in Thailand, as well as hot spring tourism as one of the types of wellness tourism, which attracts domestic and international travelers to visit annually for a holiday activity. In this paper, the researcher reported tourists' satisfaction with products, services, and quality development of hot spring wellness tourism at Doi Saket, Thailand. This research aimed to (1) study tourists' satisfaction with the service products and service processes at the hot spring destination at Doi Saket, and (2) assess the quality development of the service providers at the hot spring destination in terms of creativity and uniqueness in health promotion. Both qualitative and quantitative research methods were used for data collection. The participants were 200 tourism stakeholders selected by purposive sampling; they were from the private sector, the public sector, the community concerned, and tourists visiting the hot spring destination at Doi Saket. As for data collection, the researcher used in-depth interview, participatory observation, focus group, participatory rural appraisal techniques to collect qualitative data, and a field survey on tourists' satisfaction with the products and services to obtain quantitative data. The obtained qualitative data were analyzed by content and frequency, whereas the quantitative data by percentage, means, and t-test. The results pointed to (1) the tourists' overall satisfaction with the hot spring service providers at a high level regarding environmental management as well as service process management; and (2) the tourism stakeholders wish to see a higher level of quality development for tourism products and services in terms of uniqueness in health promotion activities.

Keywords: *Tourist satisfaction, hot spring products and services, quality development, hot spring wellness tourism*

1 Introduction

Tourism is one of the driving forces of global economic growth and provides for 1 in 11 jobs worldwide. By giving access to decent work opportunities in the tourism sector, the society—particularly youth and women—can benefit from increased skills and professional development (<https://www.unwto.org/tourism-in-2030-agenda>, 2021). According to the report by UNCTAD and the UN's World Tourism Organization (UNWTO), in 2020, international arrivals fell by 73% from pre-pandemic levels in 2019, causing estimated losses of 2.4 trillion US dollars in tourism

and related sectors (Nebhay, 2021). Some countries use domestic tourism as one of the tools to recover its economy to mitigate the impact on jobs and businesses; and governments have taken an impressive immediate action to restore and re-activate the sector for domestic tourism to be restarted in some destinations (<https://www.oecd.org/coronavirus/policy-responses/rebuilding-tourism-for-the-future-covid-19-policy-responses-and-recovery-bced9859/>, 2020).

Thailand is one of the most visited countries in the world with 39.8 million international arrivals in 2019 as reported in Tourism Statistics Thailand 2020 (https://www.mots.go.th/more_news_new.php?cid=585,2020). The tourism industry in Thailand was one of the most negatively affected industries by the COVID-19 pandemic. In 2020, the number of international tourist arrivals amounted to only around 6.7 million, which extremely decreased more than 80 percent from 2019 (Manakitsomboon, 2021). The domestic travelers will be a major tourist segment for Thailand's tourism in 2020; Kasikorn Researchviews that the high-end tourist segment will rebound back faster than other segments (<https://www.kasikornresearch.com/> Domestic travel faces new challenges post COVID-19, 2020). The Tourism Authority of Thailand (TAT) planned on increasing the number of visitors with more spending power or from the higher-end market of medical, health and wellness tourism. Particularly, medical tourism made a significant contribution to Thailand's economy, generating 3.1 billion US dollars in 2014 from building its image as a high-end tourism destination. According to the Tourism and Sports Ministry, Thailand received 6.7 million international visitors in 2020. When compared to 2019, the total of international visitors decreased by 83.21% from 39.9 million.

Table 1: The Statistics of Tourism Arrivals and Receipts 2010-2021

Year	Number of International Arrivals (million)	Receipts (billion US dollar)
2010	15.9	23.8
2011	19.2	30.9
2012	22.4	34.6
2013	26.5	41.8
2014	24.8	38.5
2015	29.9	44.9
2016	32.6	48.5
2017	35.4	57.1
2018	38.4	61.4
2019	39.8	65.1
2020	6.7	1.1
2021*	0.04	-

* January - June

Sources: Ministry of Tourism and Sports/ www.thaiwebsites.com (2021);

<https://www.knoema.com/atlas/Thailand/Tourism-receipts/> Thailand - International tourism receipts (n.d.); Phakdeephirot (2020)

Health and wellness tourism accounts for a significant proportion of the world's tourism consumption, with components ranging from hot spring bathing for leisure and recreation, through

mineral water use in health treatments under the supervision of highly specialized medical professionals, to water treatments in the wellness and beauty therapy sector and the use of mineral water for drinking purposes (Erfurt-Cooper & Cooper, 2009). Hot Springs are a natural phenomenon that has hot water flowing up from underground. Thailand has 112 hot springs in the northern, western, central and southern locations with hot water temperatures at the surface from 40 to 100 degrees celsius. Hot springs are not only for tourist attractions but also for power generation, industry, and agriculture (<http://www.absolutethai.com/hot-springs-in-thailand/>, 2021). Natural hot springs across Thailand have been developed into tourist attractions, and wellness resorts offering health packages combining mineral baths, Thai traditional massage, and fitness facilities. Doi Saket hot springs are one of seven hot spring destinations in Chiang Mai, a northern province in Thailand. The local community developed a sharing bathhouse where local villagers bathe themselves in the morning and evening, especially in winter as part of their rural lifestyle (Citylife, 2019). According to Matichon Online (2018), Doi Saket has been promoted as a spa town and a hot spring village tourism destination with outdoor thermal pools, private bathrooms, parking with landscape adjustment for wellness tourism attraction site for both domestic and international tourists. This spa town has two large hot springs temperature of 80 degrees celsius, and 4-5 smaller hot springs, some of which are used by the villagers to bathe, wash, boil eggs or use to blanch vegetables to preserve food. It is the use of natural resources as the way of life of the community like in Japanese Onsen.

In Thailand, hot spring tourism is still niche tourism and has not attracted a large number of tourists as it should be (<https://www.oxfordbusinessgroup.com/analysis/quantity-and-quality-efforts-promote-country-high-end-destination>, n.d.)/Thailand builds its image as a high-end tourism destination). Doi Saket hot springs are currently managed in an old-style management--lacking in both service design of modern tourism and integration of different sectors in development. From the researcher's observation, the current development does not seem to meet the needs of customers, and thus not being able to create value-added products and services. In this regard, the researcher would like to study tourists' satisfaction with products, services, and quality development of the hot springs for wellness tourism at Doi Saket. It was expected that the obtained findings can shed light on quality development by stakeholders--the government, the private sector, and the local community--to create a competitive advantage for this location. This was to attract domestic and foreign tourists with uniqueness of products and services in support of the *sustainable economy* of the local community (Jetjirot, 2021).

2. Research Objectives

There were two research objectives:

- (1) To study tourists' satisfaction with the service products and service processes at the hot spring destination at Doi Saket, and
- (2) To assess the quality development of the service providers at the hot spring destination in terms of creativity and uniqueness in health promotion.

The emphasis of this research was on customer satisfaction, hot spring products, services, and quality development. The results of the study were expected to identify customer satisfaction with products and services of the hot spring destination, in order to develop the

quality of service providers to meet needs of stakeholders and tourists. The researcher planned to collect data from both samples of stakeholders and tourists at Doi Saket Hot Springs.

3. Literature Review and Related Research

This section covers literature review in various aspects: customer satisfaction, health and wellness tourism, hot spring tourism, products and services of hot spring tourism, quality development, Doi Saket Hot Springs, followed by related research in the areas of hot spring tourism, customer satisfaction with hot spring products and services, quality development by hot spring providers, and hot spring creative tourism.

3.1. Literature Review

3.1.1 Customer Satisfaction

Customer Satisfaction Theory (CSAT) is a key performance indicator that tracks how customers are satisfied with an organization's products and/or services. It's a psychological state that is measured by customer expectations and reflects evaluated relationship between a customer or consumer and a company, an environment, a product, or a service. Satisfaction involves one of three psychological elements: cognitive (thinking/evaluation), affective (emotional/feeling), and behavioral (action). Expectations are beliefs (likelihood or probability) that a product and/or service with certain attributes, features, or characteristics will produce certain outcomes (benefits or values), given certain expected levels of performance based on previous affective, cognitive, and behavioral experiences. Expectations are often related to satisfaction and can be measured by (1) value of the product/service fulfilling the expectation, (2) like/dislike of the product/service, (3) the expected level of performance versus the desired expectations, and (4) satisfaction often determined by the frequency of use (<https://www.qualtrics.com/au/experience-management/customer/customer-satisfaction-theory/>, 2021). Customer satisfaction can be defined as a measurement that determines how happy customers are with a company's products, services, and capabilities. Customer satisfaction information obtained from surveys and ratings, can help a company determine how to best improve or change its products and services (<https://www.asq.org/quality-resources/customer-satisfaction>, 2021)

According to Mothersbaugh & Hawkins (2016), marketers have discovered that it is more profitable to maintain existing customers than to replace them with new customers. Retaining current customers requires that they be satisfied with their purchase and use of the product. Thus, customer satisfaction is a major concern of marketers. One must have a thorough understanding of the potential consumers' needs and of their information acquisition processes to succeed at this task. However, creating satisfied customers and thus future sales, requires that customers continue to believe that the brand meets their needs and offers superior value after they have used it. The product or service must deliver as much or more value than customers initially expected, and it must be enough to satisfy their needs.

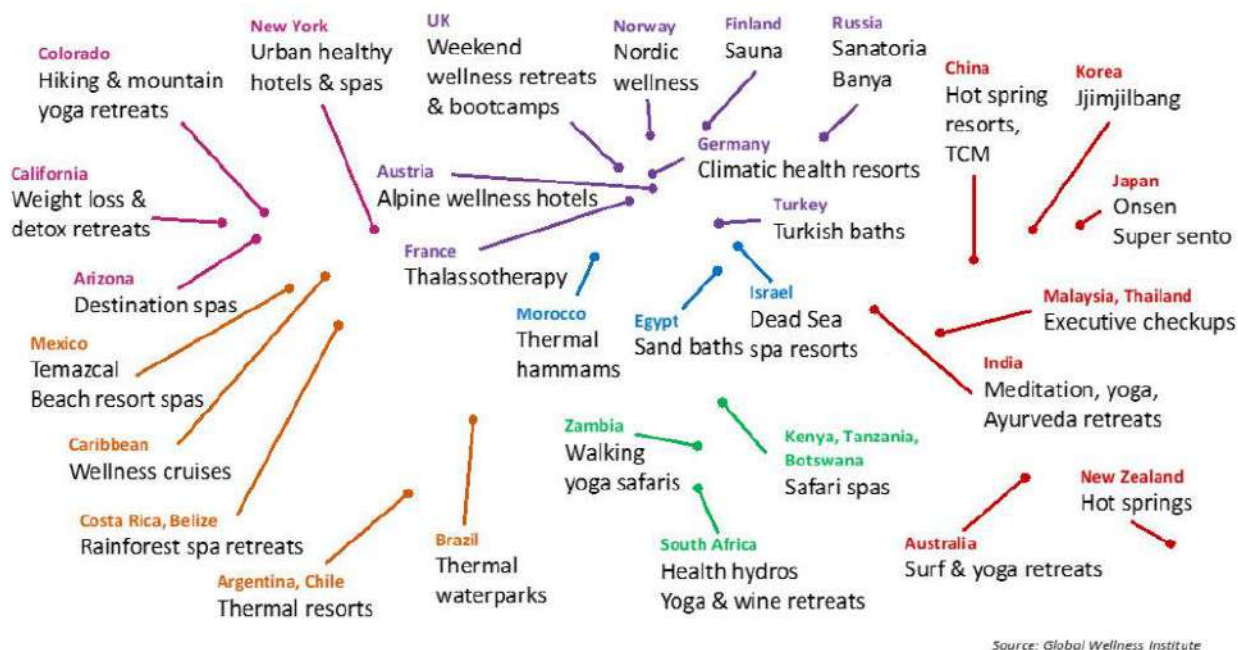
3.1.2 Health and Wellness Tourism (GWI, 2021)

Wellness tourism is the powerful intersection of two large and growing industries: the \$2.6 trillion tourism industry and the \$4.2 trillion wellness industry. Holistic health and prevention increasingly determine consumer decision-making, and people expect to continue healthy lifestyles and wellness routines when far from home. The Global Wellness Institute (GWI) defines wellness tourism as a travel associated with the activity of maintaining or enhancing one's personal wellbeing. Wellness tourism is often conflated with medical tourism—not only by consumers but in destination marketing. Sometimes the term “health tourism” is also used as a catch-all to describe many types of medical and wellness services and activities—from open-heart surgery and dental care to destination spas and yoga retreats—causing further confusion. In fact, these two sectors operate largely in separate domains and meet different consumer needs.

The differences between health and wellbeing are:

- The medical paradigm treats poor health, injury, and illness, for example traveling to another place to receive surgery or dental treatment because it is more affordable, higher quality, or not available at home.
- Wellness is the proactive things to maintain a healthy lifestyle, reduce stress, prevent disease, and enhance our wellbeing. This is what motivates wellness tourism.

Global Wellness Institute (GWI) identifies two types of wellness travelers: (1) a traveler whose trip or destination choice is primarily motivated by wellness, and (2) a traveler who seeks to maintain wellness while traveling or who participates in wellness experiences while taking any type of trips for leisure or business. Every destination has its distinctive flavors in relation to wellness, linked with its local culture, natural resources, foods, and the like. Some travelers may be satisfied with a generic massage, exercise class, or smoothie. In particular, the millennial generation wellness travelers are interested in what the destination offers--that is, different from someplace else. These unique and authentic experiences, such as indigenous healing practices, ancient/spiritual traditions, native plants and forests, special muds/ minerals/ waters, vernacular architecture, street vibes, local ingredients and culinary traditions, history, and culture. There is always something unique to offer to wellness travelers because each destination is different.

Figure 1: Every Destination with Something Unique to Offer

Source: Global Wellness Institute (2021)

3.1.3 Hot Spring Tourism

A hot spring is a thermal spring having water warmer than 98°F (37°C); the water is usually heated by emanation from or passage near hot or molten rock (<https://www.dictionary.com/browse/hot-spring>, 2021). A hot spring, hydrothermal spring, or geothermal spring is a spring produced by the emergence of geothermally heated groundwater onto the surface of the Earth. The groundwater is heated either by shallow bodies of magma (molten rock) or by circulation through faults to hot rocks deep in the Earth's crust (Farmer, 2000). For thousands of years, humans have made use of hot springs for bathing, relaxation, or medical therapy. However, some are hot enough that immersion can be harmful, leading to scalding and, potentially, death (<https://www.nps.gov/subjects/geology/hot-springs.htm>, 2020). A hot spring or thermal spring has temperatures considerably higher than the air temperature of the surrounding region. Most hot springs discharge groundwater that is heated by shallow intrusions of magma (molten rock) in volcanic areas. However, some thermal springs are not related to volcanic activity (Rogers, n.d.). Erfurt-Cooper (2010) stated that natural hot springs or thermal springs are simply categorized by temperature as: (1) cold springs with temperatures less than 25° C, (2) tepid springs with temperatures between 25° C and 34° C, (3) warm springs with temperatures between 34° C and 42° C, and (4) hot springs with temperatures above 42° C.

People have enjoyed hot springs as physical relaxation for thousands of years. Even macaques or snow monkeys in Japan use hot springs to protect themselves from cold

stress. Hot spring baths (*onsen*) have been in use in Japan for at least two thousand years, traditionally for cleanliness and relaxation, but increasingly for their therapeutic value. In the Homeric Age of Greece, baths were primarily for hygiene, but by the time of Hippocrates, hot springs were credited with healing power. The popularity of hot springs has fluctuated over the centuries since then, but they are now popular around the world (Tubergen, 2002). In Thailand, hot springs have been used for a long time for direct bathing, boiling, and preserving agricultural products, curing and drying crops and foods (Charusiri et al., 2003).

Hot springs with high mineral content are often termed medicinal waters as a result of their physical and chemical characteristics and applied for thermal therapies to prevent illness as well as to restore health. The mineralization can become a major tourist attraction in its own right with spectacular results, as seen at Pamukkale in Turkey. Hot springs come in many forms and some emerge quietly out of the ground, but others arrive at the surface with great noise and visual effect, overwhelming in their unique natural forms. The geothermal manifestations, such as geysers, hot rivers, hot waterfalls, boiling lakes, and mud ponds are highly sought after as tourist must-see destinations worldwide, like Geyser in Iceland. While many hot springs are used only to serve as a draw-card for health and wellness spa tourism, the joint proximity to active volcanic environments offers some kind of added value. Visitors to hot springs range from domestic and international tour groups and people interested in nature and outdoor activities, scientists and researchers of unusual environments, to photographers and those who can afford the rather unique holiday experience. There has been a high number of hot spring environments with distinctive and unique natural surroundings in many countries that create economic value for the tourism industry (Erfurt-Cooper & Cooper, 2009). In addition, the healing powers of hot springs have been widely accepted in Europe and Japan as natural treatment options for various common ailments, such as boosting blood circulation, reducing stress and promoting sleep, relieving pain, and healing skin problems (Pope, 2020).

3.1.4 Types of Hot Springs in Asia

The example types of hot springs in Asia are:

- (1) Natural hot spring: Self-flowing hot spring within its original landscape, including seaside, forest, mountains, canyons, wetlands, bamboo forest, volcanoes. Emphasis is on the relaxing and restorative benefits of nature.
- (2) Leisure hot spring and Traditional Chinese Medicine (TCM): Relaxation and leisure tourism for the mass market. TCM-related services are added as a selling point: herb bath, wellness tea, and seasonal wellness buffet.
- (3) Spa hot spring: Spa resorts for the high-end market. Tranquil ambiance, 5-star service, and professional spa service. Sometimes TCM is added, for example, Brilliant Resorts, Banyan Tree, Sheenjoy.
- (4) Rehabilitation hot spring: More affordable, Asian-style sanatorium. It is now targeted mainly to seniors for basic body check, medical (usually traditional), recovery, physiotherapy, and fitness.

- (5) Sauna hot spring: An urban model for business and family use. Traditional sauna centers add more elaborate hot spring features, including foot massage relaxation (with TVs).
- (6) Entertainment hot spring: Hot Spring combined with entertainment facilities to fill the low season for resort revenue and business. Target customers are mainly families and groups.
- (7) Conference & Exhibition hot spring: Hot spring resorts often have large conference and corporate entertainment facilities (especially Karaoke Television or KTV), to balance the peak and low seasons in hot spring operations.
- (8) Agriculture hot spring: Destinations that combine hot spring resources with eco-tourism—farms for fresh produce. Land and water are often mineral-rich, resulting in better tasting produce.
- (9) Real Estate hot spring: Wellness real estate is a popular trend in a struggling real estate market. Hot springs greatly add credibility and value to these developments.
- (10) Spiritual hot springs: Geological Survey of India identified 350 hot springs in India. Many hot springs are valued for their religious significance. During religious occasions, devotees come from far and wide to touch the waters as part of their rituals.
(<https://www.nps.gov/subjects/geology/hot-springs.htm>. (2020, February 10). Geology: Hot Springs/Geothermal Features.)

3.1.5 Health Benefits and Bathing Etiquette

According to Sood (2012), balneotherapy is the use of bathing as a form of medical treatment widely practiced in Japan. Balneotherapy's benefits have been demonstrated by global peer-reviewed medical studies even though considered an "alternative medicine." Sulfur and magnesium found in hot springs promote skin health, while the heat of these baths can reduce inflammation and pain, and boost the immune system. Japanese onsen must be at least 25⁰ C, and some get to 100⁰ C.

Onsen bathing is an important part of Japanese culture, and Cheung (2021) reported its proper and well-established etiquette as follows:

- Undress before entering. At the onsen, everyone is expected to get stark naked—no exceptions and non-negotiable.
- Onsen baths are meant for soaking only, meaning not supposed to clean in the bath, scrub clean before dip in, and don't make a splash.
- The optimal way of soaking is to submerge in the water up to the shoulder, hair is not supposed to touch the water, no towels in the water either.
- Onsen is a singular experience but seriously, no photos and no mobile phones.
- Though many onsen hotels offer baths indoors, soaking in the hot spring waters outdoors is the best way to go, especially in winter when snowing.

- Most onsen baths are gender-segregated but mixed baths do exist. Most allow towels or swimsuits for modesty but the ancient ones might not—enter at own peril.
- For safety don't soak for too long. Drink plenty of water before and after, but avoid alcohol. Eating right before or after bathing is not recommended.
- Onsen is a place for relaxation; don't be loud and obnoxious while talking with your companions.
- Finally, as leaving, there's no need to rinse after the bath but do wipe dry before reentering the dressing area.

3.1.6 Wellness Tourism Quality Standards of Natural Hot Springs in Thailand

The standards of natural hot spring destination are intended to be a framework for managing natural hot spring destinations with an emphasis on setting the standards necessary for quality services. The safety of tourists is important and must not abuse natural resources and the environment. The natural hot spring wellness tourism standards are to be used by the establishments responsible for tourism destinations as a tool to verify their tourist destination standards. They convey important information to guide tourists' decision-making as well as to upgrade services at natural hot spring wellness tourism destinations in Thailand.

There are two components of quality standards of natural hot spring destinations as follows (www.tourism.go.th, 2014):

Component 1: Key standard of wellness tourism destination of natural hot springs for services essential for tourist attraction destinations.

Component 2: Perspective as a wellness tourism destination of natural hot springs as being unique in various fields, potential to support future developments, and utilization of the area for sustainability.

3.1.7 Doi Saket Hot Springs

Doi Saket Hot Springs are located at Doi Saket District, Chiang Mai, in the northern part of Thailand. They are natural hot springs originating from the plain which is surrounded by rice fields. The local authorities have developed the hot springs into a sharing bathhouse where local villagers come to bathe in the morning and cold evenings. The villagers usually bring bowls and bathe in the middle of nature and cool air, as a local rural lifestyle. There are two hot springs for bathing--the first as a public bath on the roadside. There are many private bathrooms at the hot springs, a pond for dipping feet, a hot spring pool, a pond for boiling eggs, restaurants, a coffee shop, and traditional massage areas. In 2018, there were Spa City and Onsen Villa as a major tourism project at Doi Saket to renovate, develop, and expand tourism business, and landscape the overall area with a swimming pool, a private plunge pool, a hot spring pond, a thermal bath building, toilets, traditional massage services, and parking spaces. The project was based on the sufficiency economy village tourism model to put the hot springs

at Doi Saket as one of the main destinations for wellness tourism for both domestic and foreign visitors.

3.2 Related Research

This section reports findings from research related to hot spring service quality, consumer satisfaction, and issues of concern for hot spring tourism.

Chen et al. (2009) studied the determinants for improving hot spring customer satisfaction. In the hot spring tourism industry, customer satisfaction has become a crucial issue for competitiveness. A company cannot implement several customer satisfaction improvements due to limited resources. The researchers asserted that companies should evaluate the relationships among success factors and paid attention to determinants for their improvement implementation. The results show “Environment Quality,” “Special Resource,” “Convenience,” “Food,” “Service Quality,” and “Facilities” as decisive factors for customer satisfaction. The findings generate important implications for hot spring management and practice, which can help hot spring operators to better plan and design effective improvement strategies to attract potential new consumers and retain their current consumers, though with limited resources.

Lee et al. (2009) explored a demand-side perspective on the factors determining the attractiveness of Taiwan as a hot spring tourism destination. Three variables--“gender,” “age” and “perceived importance of accommodation”-- were significant predictors of the frequency of hot springs visits. The findings of this study suggested that hot springs proprietors should work closely with the government sector to ensure tourist safety and security and to extend the appeal of the hot spring tourism experience into health promotion and medical treatment. Hot spring proprietors seemed to focus on older males and were less concerned about the provision of quality accommodation.

Boekstein (2014) wrote a paper on “from illness to wellness--has thermal spring health tourism reached a new turning point?” to show a turning point for the thermal spring health tourism product from illness treatment to health promotion and wellness. The paper discusses the historical development and geographical distribution of thermal spring tourism, new highlighted developments, and those involved in local communities. It is concluded that the medicinal properties of thermal waters are now successfully used for wellness treatments. It is recommended that developing counties create thermal spring tourism products that combine thermal water resources with location-specific healing methods and cures, but are extended to incorporate surrounding natural and cultural attractions, and where possible, involve local communities for benefits and participation.

Thermal bathing facilities are in many countries and have an important and longstanding reputation for successful health and wellness treatments based on the use of geothermal waters sourced from natural hot springs. Today, one of the fastest-growing sectors of world tourism is health and wellness spa tourism. Many holiday destinations have offered the recreational use of geothermal springs in resorts and water parks combined with access to

medical thermalism under established standards. Associated geothermal phenomena, such as boiling lakes, mud ponds, and erupting geysers have also fascinated people wherever they occur and many have been developed into unique tourist destinations with a high visual impact (Erfurt-Cooper, 2010).

(Ladplee, 2019) examined tourists' behavior and satisfaction with health tourism at Hin Dad Hot Springs, Thong Pha Phum District, Kanchanaburi in four areas: Location, Facilities, Personnel (or Service providers), and Tourism Activities.

(1) Location: the site should provide more space for recreation in the surrounding area. Regularly checking the quality and quantity of minerals water of the soaking pond is to prevent microbes that cause diseases which may come from some other customers.

(2) Facilities: the operator should provide a private room zone for private mineral bath operated regularly, and increase a variety of restaurants for tourists to choose healthy food or proper diet.

(3) Personnel/Service providers: the service provider should increase the number of service staff members with knowledge about health tourism attractions around hot springs to be ready to serve tourists during operating hours. It is also recommended for service providers to wear uniforms so that tourists can identify them easily at Hin Dad Hot Springs.

(4) Tourism activities: the tour organizer should increase variety in activities and generate more activities with involvement of members of the community.

Hot spring tourism offers multiple aspects of cultural experience and physical and mental relaxation. It has increasingly attracted attention as it meets the high demand of tourists for physical and mental well-being due to people's stressful and competitive lifestyle in modern society. The aspects of health care and disease treatment are the fundamental value of hot spring tourism. For a comprehensive understanding of the health values of hot spring tourism, this paper reports the effects of hot springs on human health from the perspectives of heat, elements and functions as in bathing. It also shows the relationship between hot spring tourism and human health, thereby providing a conceptual reference for the future development of hot spring tourism.

4. Research Methodology

The researcher used a questionnaire to collect quantitative and qualitative data. Quantitative data dealt with the relationship between one aspect (an independent variable) and another (a dependent variable) and the customer satisfaction with the products and services of hot spring tourism destinations. The researcher tried to quantify the relationship between variables featured in the study: demographic profile, customer behavior, and mean values of products and services in hot spring tourism at Doi Saket, Chiang Mai, Thailand. Qualitative data were the respondents' viewpoints in response to the open-ended question regarding their satisfaction with quality of hot spring products and services.

4.1 The Respondents

The respondents were 200 customers and stakeholders of the hot spring tourism at Doi Saket, selected by purposive sampling.

4.2 Research Instrument

The study used both primary and secondary data to understand consumer behavior toward products and services in hot spring tourism. The researcher wanted to identify the customers' satisfaction toward products, service, and quality development at Doi Saket hot spring. The researcher used a questionnaire in four sections: (1) demographic profile, (2) tourists' behavior in hot spring tourism, (3) satisfaction with products and services, and (4) an open-ended question on quality development from tourism providers. The questionnaire put the respondents' satisfaction with product/ service quality on a Likert scale, ranging from 1=very dissatisfied, 2=dissatisfied, 3= neutral, 4 = satisfied, 5=very satisfied. The researcher wanted to assess product and service quality in terms of environment, mineral quality, bathroom facility and private zone.

5. Results and Discussion

5.1 Demographic Variables

The respondents' demographic variables are presented in Table 2 as shown below.

Table 2: The Respondents' Demographic Variables

Variables	Details	Frequency	Percent
Gender	Male	95	47.5
	Female	105	52.5
Age group	Less than 20	11	5.5
	21-30	55	27.5
	31-40	53	26.5
	41-50	26	13.0
	51-60	36	18.0
	Older than 60	19	9.5
Marital status	Single	74	37.2
	Married	119	59.8
	Divorced/Widowed	6	3.0
Level of education	Primary school	21	10.5
	High School	54	27.0
	Vocational Certificate/Diploma	23	11.5
	Bachelor degree	89	44.5
	Master degree	8	4.0
	Higher than master degree	5	2.5
Occupation	Officers	28	14.0
	Private company employees	28	14.0
	State enterprise employee	12	6.0
	Agriculturist	21	10.5
	Businessman/Owner	18	9.0

Variables	Details	Frequency	Percent
	Retiree/Unemployed	8	4.0
	Workers	35	17.5
	Students	33	16.5
	Others	17	8.5
Monthly income (baht)	Less than 5,000	40	20.0
	5,001-10,000	44	22.0
	10,001-15,000	30	15.0
	15,001-20,000	39	19.5
	20,001-25,000	19	9.5
	More than 25,000	28	14.0

Most of the tourists who visited Doi Saket Hot Springs, Chiang Mai were 105 females (52.5%), and 95 males (47.5%). Most tourists were between 20-30 years old at 55 (27.5%), followed by 31-40 years old at 53 (26.5%); 51-60 years old at 36 (18.0%); 41-50 at 26 (13.0%).

5.2 Consumer Behavior

Table 3: Customers' Behavior at Doi Saket Hot Springs

Variables	Details	Frequency	Percent
Address	Chiang Mai	127	63.8
	Others	72	36.2
Information channels	Relative/friend	114	57.3
	Travel agency	8	4.0
	Radio/television	9	4.5
	Internet	29	14.6
	Magazine/Journal	15	7.5
	Advertising/Public Relations	-	-
	Others	24	12.1
Vehicle for traveling	Private car	154	77.0
	Bus	12	6.0
	Motorcycle	31	15.5
	Bicycle	3	1.5
Number of participants	Alone	28	14.0
	2-4 people	117	58.5
	5-7 people	40	20.0
	8-10 people	14	7.0
	More than 10 people	1	.5
Number of times to visit hot springs	First time	101	50.5
	More than 1 time	99	49.5
Number of times to do activities or using services at hot springs	once a week	34	17.1
	once a month	45	22.6
	2-3 times a month	22	11.1
	others	98	49.2

Variables	Details	Frequency	Percent
Service rates in hot spring tourism	Less than 100 baht	109	54.5
	101-200 baht	58	29.0
	201-300 baht	21	10.5
	More than 300 baht	11	5.5

Customer behavior in terms of decision-making is shown in Table 3. The respondents made their decision on visiting the hot springs as follows: most of the visitors were local people (127=63.8%) living in Chiang Mai; 72 (36.2%) from other provinces, 114 (57.3%) decided to visit the hot spring by information from friends/relatives, 154 (77.0%) travel by private car, 117 (58.5%) travel with 2-4 people on the trip, 45 (22.6%) preferred to spend time at the hot spring once a month, 109 (54.5%) were willing to pay less than 100 baht per person.

5.3 Objectives of Traveling

Table 4: Objectives of Traveling to Doi Saket Hot Springs

Objectives of Traveling	Frequency	Percent
Relaxation/Recreation	146	73.0
Cure disease	14	7.0
Meet friends	10	5.0
Stress relief	30	15.0

Table 4 shows the objectives of tourists visiting Doi Saket Hot Springs: 146 (73%) traveled to this place for relaxation/ recreation, 30 (15%) came to relieve stress, and 14 (7%) visited for disease-treatment.

5.4 Service Activities for Tourists

Table 5: Service Activities for Tourists at Doi Saket Hot Springs

Service Activities at Hot Spring Tourism	Frequency	Percent
Mineral bath/hot spring bath	152	76.0
Spa massage	57	28.5
Have a meal	75	37.5
buy souvenirs	11	5.5
view the scenery	31	15.5
Others	1	.5

Note: Respondents can answer more than one activity.

Table 5 reports service activities for tourists at Doi Saket Hot Springs: 152 (76%) enjoyed mineral bath or hot spring bath, 75 (37.5%) visited this place to have a meal, and 57 (28.5%) came for spa massage.

5.5 Customer Satisfaction

Table 6: Customer Satisfaction with Products and Services at Doi Saket Hot Springs

Customer Satisfaction with Products and Services at Doi Saket Hot Springs	Mean	SD.
The hot spring tourism destination has an appropriate environment for service use.	3.83	0.697
The hot spring tourism destination is equipped with facilities apposite for service use.	3.84	0.697
Reasonable service	3.88	0.748
Cleanliness of the water for appropriate in-service use.	3.86	0.722
The utilization of the area is clearly allocated, with space for various activities/services conveniently.	3.91	0.803
There is privacy for each user.	3.92	0.761
Hot spring tourism has safety management of the destination.	3.90	0.77
Hot spring tourism destination is easily accessible by large vehicles, such as cars, buses, or sightseeing vehicles.	4.03	0.83
There are other types of tourism activities/services within the hot spring tourism destination.	3.84	0.80
There are signs or other types of media to show the types of use of the natural hot springs, such as for bathing, for foot baths, for cleansing, and the like.	3.91	0.82
There are signs or other types of media to show the benefits of using the hot spring tourism destination.	3.71	0.73
There are signs or other types of media to show how to soak/bath in hot springs.	3.72	0.79
There are signs or other types of media to display advice, announcements, or cautions for users with congenital diseases.	3.68	0.89
Message displayed in badges or other media contains complete and detailed content.	3.68	0.82
Message displayed in signs or other types of media is easy to understand.	3.74	0.78
Messages displayed on signs or other media are in both Thai and English.	3.80	0.83
The place has installed signage or other types of media clearly visible.	3.80	0.77
There is a sign or device indicating the water temperature in the hot spring/bath service area.	3.72	0.95
No bad smell in hot spring room/hot spring bath/pool.	3.72	0.78
There is enough light for the service area thoroughly.	3.90	0.73
There are rooms/bath pools especially for the disabled or the elderly.	3.70	0.82
Handrails or other devices are installed for convenience and safety of the disabled or the elderly.	3.77	0.81
There is a cold water or shower to alternate or in combination with a hot spring bath.	3.82	0.80
There is an alarm bell to call in the private room/ bath pool in case of an emergency.	3.71	0.87
There is an alarm bell to call in the common room/ bath pool in case of an emergency.	3.67	0.89
There is a watch that can be seen clearly and easy to look at all times.	3.74	0.82
Total	3.81	0.50

The customers' satisfaction with products at Doi Saket Hot Springs tourism is shown in Table 6. The respondents were positive to the hot spring tourism destination at Doi Saket as shown by high mean value of satisfaction: (1) easy access by large vehicles, such as cars, buses or sightseeing vehicles with high satisfaction at 4.04; (2) privacy at 3.92; (3) signs or other types of media to show the benefits of using the hot spring tourism destination at 3.91; (4) safety management at the destination and sufficient lighting in the service areas at 3.90, respectively.

5.6 Pearson Chi-square

Table 7: Number and Chi-square of the Relationship between Status and Travel Objectives

Objectives of Traveling	Status						Pearson Chi-square P = .000
	Single		Married		Divorce		
	Number	%	Number	%	Number	%	
Relaxation/Recreation	48	67.6	92	78.0	4	66.7	
Cure disease	4	5.6	8	6.8	1	16.7	
Meet friends	4	5.6	4	3.4	0	0	
Stress relief	15	21.1	14	11.9	1	16.7	
Total	71	100	118	100	6	100	

* Significantly at the .05 level

Statistical assumptions

$H_0: p = 0$ Objectives of traveling is not dependent on status

$H_1: p \neq 0$ Objectives of traveling is dependent on status

P (probability) = 0.000, α (significance level) = .05

Therefore, the P-value is less than the value α , so rejected H_0 and accepted H_1 .

In conclusion, the objectives of traveling are dependent on the status at the significance level .05.

Table 7 shows the objectives of traveling as dependent on status at the significance level .05. Single visitors (48 of 71 = 67.6%) traveled for relaxation/recreation while married visitors (92 of 118 = 78%) also made their trip for relaxation/recreation. The other four divorced visitors (4 of 6 = 66.7%) shared the same traveling objective.

5.7 Mean, S.D. and t-test

Table 8: Mean, S.D and t-test of Product/Service Satisfaction at the Hot Springs Classified by Gender

Hot Spring Products/Services	Male		Female		t	P
	Mean	S.D	Mean	S.D		
The hot spring tourism destination has an appropriate environment for service use.	3.82	.684	3.84	.712	-.156	.876
The hot spring tourism destination is equipped with facilities apposite for service use.	3.88	.666	3.81	.725	.773	.441
Reasonable service	3.83	.709	3.93	.783	-.943	.347
Cleanliness of the water for appropriate in-service use.	3.97	.721	3.77	.714	1.957	.052
The utilization of the area is clearly allocated, with space for various activities/services conveniently.	3.93	.815	3.90	.795	.197	.844
There is privacy for each individual user.	3.88	.797	3.95	.729	-.626	.532
Hot spring tourism has safety management of the destination.	3.91	.800	3.90	.735	.022	.983
Hot spring tourism destination is easily accessible by large vehicles such as cars, buses, or sightseeing vehicles.	4.06	.755	3.99	.898	.616	.539
There are other types of tourism activities/services within the hot spring tourism destination.	3.90	.777	3.78	.816	1.121	.264
There are signs or other types of media to show the types of use of the natural hot springs, such as for bathing, for foot baths, for cleansing, and the like.	3.89	.765	3.92	.867	-.244	.808
There are signs or other types of media to show the benefits of using the hot spring tourism destination.	3.71	.650	3.71	.797	-.061	.952
There are signs or other types of media to show how to soak/bath in hot springs.	3.73	.791	3.71	.797	.131	.896
There are signs or other types of media to display advice, announcements, or cautions for users with congenital diseases.	3.75	.825	3.63	.947	.968	.334
Message displayed in badges or other media contains complete and detailed content.	3.63	.730	3.73	.899	-.826	.410
Message displayed in signs or other types of media is easy to understand.	3.66	.738	3.82	.810	-1.399	.163
Messages displayed on signs or other media are in both Thai and English.	3.82	.758	3.78	.892	.358	.721
The place had installed signage or other types of media clearly visible.	3.82	.743	3.78	.800	.384	.701
There is a sign or device indicating the water temperature in the hot spring/bath service area.	3.74	.970	3.70	.934	.259	.796

Hot Spring Products/Services	Male		Female		t	P
	Mean	S.D	Mean	S.D		
No bad smell in hot spring room/hot spring bath/pool.	3.78	.717	3.66	.832	1.044	.298
There is enough light for the service area thoroughly.	3.88	.666	3.92	.784	-.375	.708
There are rooms/bath pools especially for the disabled or the elderly.	3.75	.729	3.66	.903	.750	.454
Handrails or other devices are installed for the convenience and safety of the disabled or the elderly.	3.80	.681	3.74	.918	.524	.601
There is a cold pool or shower to alternate or in combination with a hot spring bath.	3.79	.770	3.85	.837	-.552	.581
There is an alarm bell to call in the private room/ bath pool in case of an emergency.	3.69	.868	3.73	.874	-.308	.759
There is an alarm bell to call in the common room/ bath pool in case of an emergency.	3.68	.918	3.66	.867	.163	.871
There is a clock that can be seen clearly, easy to look at all times.	3.78	.844	3.72	.801	.518	.605
Total	3.8135	.48055	3.8073	.52678	.085	.932

* Significance level = 0.05

Table 8 shows the different levels of customers' satisfaction of products and services at Doi Saket Hot Springs as classified by gender. The results revealed that the satisfaction level of product/services was not significantly different at 0.05. The male and female visitors of Hot Spring 4 did not differ in their criteria in judging products and services of the hot springs.

5.8 Services Delivered at Doi Saket Hot Springs

From the researcher's observations and interviews with the stakeholders, that is, local chiefs, government administrators, community, and tourists at Doi Saket Hot Springs, they were concerned with two issues: (1) the standards of natural hot spring wellness tourism attractions, and (2) the potential of Doi Saket as a wellness tourism destination.

5.8.1 The Main Standards of Natural Hot Spring Wellness Tourism Attractions

The stakeholders expressed their concern as follows:

- (1) The quality of hot springs, water has a high temperature but there is a limitation in foul smell of sulfur. The host should find ways to reduce the smell of water with the use of herbs to deodorize the bathroom.
- (2) Private and common hot spring bathrooms/hot spring bath pond/swimming pool should be separated for men and women. The soaking room should be clearly divided for men/women in the areas of the swimming pool and massage, including the water system for separate sections.
- (3) There must be clear separation of male and female shower/toilet/changing rooms. Toilets require regular cleaning.

- (4) Security management needs upgrading from water temperature indicating devices to personnel training in tourism safety management at regular times and in emergencies.
- (5) Overall tourism destination environmental management is good but should provide more trash bins in various spots to keep the surrounding clean. They recommended planting large trees for more shady areas.

5.8.2 Potential Of Doi Saket for a Natural Hot Spring Wellness Tourism

Destination

- (1) Doi Saket Hot Springs could be a good tourism attraction, with water temperature up to 90 C. Egg boiling ponds and various hot spring products are appealing to tourists; more activities should be added to the day-tour schedule.
- (2) The place can accommodate more tourists with a variety of services, such as body massage, foot bath and massage, soaking room, private/communal bathrooms, and hydrotherapy swimming pool. The location is large and easily accessible; the host can modernize it with appropriate landscaping with boutiques or shops, eating areas and activity/ service points—with clear signs for direction.
- (3) The host should provide more staff to guide hot water bathing. More are requested of resting spots, sitting areas, and parking space.
- (4) There should be a clear-cut policy from the local authority on land use for sustainable tourism.

6. Conclusion and Future Research

6.1 Conclusion

The researcher concluded the study with three major points:

- (1) Consumer satisfaction with products and services in hot spring destinations.
Overall, the respondents were satisfied with the hot spring tourism products and services and the top 5 were: tourists are most satisfied with accessibility by large vehicles with an average of 4.03, followed by privacy for each user with an average of 3.92, signage/media usage with an average of 3.91, destination safety management and adequate lighting for the destination with the same mean of 3.90, respectively.
- (2) Service processes in hot spring destinations.
The service process of the hot springs at Doi Saket has four steps: (1) Hospitality, (2) Reception (Front Stage), (3) Back Support Unit (Back Stage Action), and (4) Support Process Unit.
- (3) Quality of service providers in hot spring destinations.
Doi Saket Hot Springs have temperatures up to 90 degrees celsius that can boil eggs in a few ponds; the location is spacious and can be modernized and allocated into proportions for various functions. The hot springs have a variety of products, such as Thai massage, foot bath, hot bath, private/communal bath, hydrotherapy pool, local homestay, shops and restaurants. The respondents identified such limitations as too few activities within tourist attractions, the small number of staff, services not up to

expected standards, limited parking space, a few resting points, and food shops. In such a scenario, service providers have to create more attractive products and develop the quality of service especially by the training standards of staff and service quality development.

For a hot spring tourism destination to reach customers successfully, managers need to recognize the target markets to customize their products and services to match the needs of different customers. This research showed quality and service as an essence of hot spring tourism. The findings of this research pointed to most respondents' decision-making by motivation from friends and relatives. The key objective of the customers to visit hot springs was for relaxation with mineral bath/ hot spring bath at Doi Saket. Price is also one of the key factors in attracting visitors to spend their time on organized activities and services. It is important that the host be creative in attracting and satisfying customers to the extent of deciding to revisit Doi Saket.

6.2 Future Research

The researcher suggested further studies in hot spring tourism, particularly the facilities and services of the destination, the quality of mineral water, and other recreational activities. In addition to the issues on products and services of the hot springs, it would be possible to investigate further into other related areas, especially such crucial determinants as *service process management*, *staff management*, *hot spring destination management*, and *holistic hot spring wellness*. Future research on these identified issues could be carried out in new geographical areas in Thailand. This is to have a comprehensive picture of customers' choice of hot springs for their varied needs so that managers can adjust their products, services and relevant facilities creatively and effectively.

7. The Author

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ISSN 2730-2601

RICE Journal of Creative Entrepreneurship and Management, Vol.2, No.3, pp. 23-30,
September-December 2021

© 2021 Rajamangala University of Technology Rattanakosin, Thailand

doi: 10.14456/rjcm.2021.33

Received 17.08.21/ Revised 29.08.21/ Accepted 10.09.21

Promotion of Gastronomy Tourism in Thailand after the Covid-19 Pandemic

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Abstract

The purpose of this academic paper is to propose guidelines to promote gastronomy tourism in Thailand after the Covid-19 pandemic. The promotion plan includes (1) components of gastronomy tourism, (2) types of gastronomy tourism, (3) guideline for the development of gastronomy tourism in Thailand, and (4) measures of food service establishments for hygiene safety from COVID-19. As known, tourists have been halted worldwide by COVID-19 and they yearned for trips to their desired destinations. Since foreign tourists have viewed gastronomic tourism in Thailand as a good attraction, the Tourism Authority of Thailand (TAT) needs to look for cooperation from those involved in the tourism industry to develop promoting guidelines to bring back activities of gastronomic tourism for foreign tourists who wish to visit Thailand after the lift-up of lockdowns in various countries. Gastronomy tourism in Thailand offers a variety of herbal ingredients for cooking variety of famous dishes with hygiene safety standards of the gastronomic establishment. This paper reports the proposed guidelines to promote gastronomy tourism in Thailand as preparation in various dimensions for food business operators and tourists who particularly come for gastronomy attractions after the impacts of Covid-19.

Keywords: *Guidelines, gastronomy tourism, food service establishments, Covid-19*

1. Introduction

Thailand's tourism started to decline from the end of 2019 with the Covid-19 outbreak in Wuhan, Hubei Province, People's Republic of China. As of now, the number of infected people in many countries has increased, and the death tolls fluctuated in different waves (Kasikorn Research Center, 2020). In May 2021, Thailand had only 40,447 foreign tourists visiting Thailand in January-June 2021, which was a decrease of 99.40 percent. Moreover, the number of domestic trips was 24.59 million people/time, which was a decrease by 38.45 percent, with a record of the hotel business occupancy rate dropped by 17.23 percent. In this scenario, Thailand has to wait until 2024 for Thailand tourism to pick up the aftermath of Covid 19 (Winaisathien, 2021).

The Ministry of Tourism and Sports (2021) revealed numerous projects stumbled over the Covid-19 pandemic. The Tourism Authority of Thailand (TAT) has been assigned by the Ministry of Tourism and Sports to move forward with the development of new tourism measures and products. The purpose is to revitalize the Thai tourism sector from

2021 onward while keeping up with market demands in *five groups of domestic tourism products* as follows:

- (1) Health tourism
- (2) High-end tourism and creating new experiences such as yacht tourism
- (3) Tourism with special interests, such as the singles route, the faith route, and the like
- (4) Gastronomy tourism
- (5) Sports tourism

Preparations for tourism recovery after the Covid-19 pandemic require that tourism businesses be attractive in a variety of forms, especially the gastronomy tourism business which is part of the domestic tourism policies. To attract tourists to gastronomy tourism through activities, the Tourism Authority of Thailand has used the Michelin Guide which provides information on the ranking of the best quality restaurants to guarantee the quality of ingredients, taste, creativity and consistency of signature dishes to attract tourists.

2. Concept of Gastronomy Tourism

“Food” is part of the UNESCO creative cities network. Therefore, the issue of food and tourism is interesting to culinary academics and researchers. According to their studies, food is part of creative tourism activities and value to artistic, cultural and social expressions. Values can be easily seen in society especially local food that can be used as an incentive for tourists from different cultures to enjoy learning from food (Scarpato, 2002; UNESCO, 2008). In other words, food can greatly enhance one’s travel experience. Food can act as a medium to stimulate tourists’ interest in a tourist destination (Cohen & Avieli, 2010). Often, the uniqueness of the local cuisine is used to create a “brand” of tourist attractions. Food can serve as a tool to develop strategies to attract local and international tourists (Hall & Mitchell, 2000; Hall & Sharples, 2003).

Gastronomy tourism has become a hot topic these days as well as one of the components of such a rapidly growing tourist destination as Thailand in recent years. Tourism businesses in many countries are well aware of the importance of food as a major attraction to tourists. It is not only the consumption of food in a meal, but also the creation of a new experience through tasty food to learn about culture, society and way of life of local people in tourist attractions (Booparkob et al., 2017).

3. Elements of Gastronomy Tourism

Chunkajorn & Na Thalang (2021) emphasized attraction and incentives as main causes for tourists to make travel decisions. There are three considerations:

(1) *Behavior of tourists.* The type of tourism as gastronomy attracts tourists with a passion for new local food ingredients or those they have experienced before. Months and seasons are therefore deciding factors for travelers to visit to try their favorite dishes at particular time of the year. Many food cultures affect tourists’ interest in gastronomy tourism. In addition, accessibility to gastronomy tourism via promotion of famous restaurants online has become an important marketing tool to determine today’s travelers’ decision on gastronomy destinations.

(2) *Food perception.* Local products or ingredients show distinctiveness of special dishes and the cooking method is the strength in presenting the diversity of food in gastronomy tourism. Creating food cultural awareness through gastronomy tourism activities will immerse tourists in a memorable experience with words of mouth. Local food ingredients with unique presentation of famous restaurants in the designated area, which

have been continuously promoted online, will keep tourists' craving to visit the target destination, and later on share experiences to their family members and friends. As a result, the word of mouth through online media can reach other potential tourists quickly and efficiently.

(3) *Image of food*. The image of food comes from unique ingredients, health attributes, food activities, service experience, seasons and meal times in creating pleasant memories for tourists to remember and revisit. Along with the experience of food activities, tourists can easily and quickly communicate the food image they remembered to their friends via social media and in turn stimulate viewers' interest in gastronomy tourism as shared in the pictures.

4. Model of Food Tourism in Thailand

Santawee (2019) summarized guidelines for promoting gastronomy tourism and creating an appealing image of gastronomy tourism.

A. Guidelines for promoting gastronomy tourism

- (1) Establishing a clear policy to promote food tourism
- (2) Integrating the collaboration of organizations related to food tourism
- (3) Having strategies for management and marketing of gastronomy tourism
- (4) Creating knowledge and developing personnel for gastronomy tourism
- (5) Inviting communities and private businesses to participate in promoting gastronomy tourism

B. Guidelines for creating an appealing image of gastronomy tourism

- (1) Controlling food hygiene
- (2) Establishing standards of Thai food
- (3) Overturning objectionable excuses and the culture of Thai people
- (4) Promoting street food in gastronomy tourism
- (5) Interpolating food stories in various public and online media
- (6) Communicating signature dishes via popular social media

The guidelines for creating an image of gastronomy tourism during and after the Covid-19 condition require strict cleanliness and hygiene control measures. Gastronomy tourism safety can boost confidence for tourists in both food and places of visit.

5. Guidelines for the Development of Gastronomy Tourism in Thailand

Yokkhun, Ratchaphakdee & Phitchayaron (2020) asserted that gastronomy tourists would prefer four activities:

- (1) Visiting and tasting
- (2) Learning to cook
- (3) Eating local food
- (4) Visiting food festivals

Obviously, the development of gastronomy tourism requires that local identity be created via a story telling. Tourists want to be involved in cooking to create new experiences. Their attendance at and participation in a food festival serves as a good publicity through social media; recipes can be passed as local wisdom down from one generation to the next. Tourists also prefer a tour program with activities about food and sightseeing. Food business operators in the private sector can be referred to by the Tourism Authority of Thailand for food-related events in order to attract tourists.

6. Gastronomy Tourism Potential

Chunkajorn & Na Thalang (2021) reported that gastronomy tourism will be effective when covering all aspects of gastronomy tourism. Entrepreneurs involved in gastronomy tourism need to understand gastronomy tourism in many dimensions, such as local food tourism activities, way of life as part of natural resources, food processing, marketing products, and the like. It is vitally important to link or formulate a strategy together with the service marketing mix, including:

- (1) Product: ingredient, taste, cleanliness, quantity, quality, decoration, outstanding menu and food hygiene
- (2) Price: money that consumers have to pay to service providers, compatibility with quantity and quality and price tags
- (3) Place: location, orderliness, ease of access to distribution
- (4) Promotion: public relations in tourist attractions, festivals, online media for customers to access services and provide necessary information to customers, ease of communication and customer retention activities
- (5) Process: the customer service process as efficient, accurate, fast, quality and orderly
- (6) Productivity and Quality: the ability of entrepreneurs to be ready to serve customers quickly and consistently with quality
- (7) People: ability of staff, dress, human relations, customer recognition and customers' satisfaction
- (8) Physical evidence: the internal and external environment, the atmosphere in the shop, cleanliness, including the area for organizing activities
- (9) Particularity: uniqueness and worth value of the product. It is a product that tourists buy for relatives and friends that will satisfy both the giver and the receiver
- (10) Publicity and Public Relations: credibility, images of products and services for consumers' acceptance

Gastronomy tourism business operators or government officials, private organizations, independent organizations need to be involved in the development of gastronomy tourist attractions on the basis of service marketing mix in all dimensions.

7. Measures for Gastronomy Service Establishments during the COVID-19 Pandemic

Wattanayingcharoenchai (2021) suggested preventive measures during the Covid-19 pandemic to the Department of Health, Ministry of Public Health Thailand that restaurant service areas be monitored as follows:

- (1) Screen employees before entering the work area.
- (2) Define clearly screening points, registration, entrances and exits.
- (3) Keep a distance of at least 1-2 meters between people to reduce congestion.
- (4) Ventilate the whole work and service areas.
- (5) Employees and customers wear medical masks at all times.
- (6) Clean tables immediately after service, including the bathroom common touch points and waste bins.
- (7) Organize sole personal food equipment without sharing.
- (8) Evaluate the restaurant's service procedure via *Thai Stop COVID-19 Plus App* and clearly post a Covid-19 measure notice for employees to observe, followed by assessment scanned and sent through *Thai Safe Thai App* before starting work and upon leaving the workplace.
- (9) Use the online queue booking system for onsite and take-out service, as applicable.

In case of finding infected guests at the entry check-point, the restaurant needs to notify the Covid-19 emergency call number immediately. The required action is to close the shop or service place immediately for at least 1-3 days to clean and disinfect thoroughly according to the virus control measures imposed by the Ministry of Public Health Thailand. If the store or service place is to be reopened, the manager needs to assess all specified measures to ensure confidence for customers or gastronomy tourists to revisit the restaurant with trust in its hygiene safety precautions.

8. Conclusion

Gastronomy tourism deals with a journey to experience food after the Covid-19 pandemic for entertainment and recreation purposes at culinary sites, food festivals, food markets, cooking shows and demonstrations, and other related activities that have been interrupted at the times of infection waves of one to four from 2019-2021—rather a long time after the first outbreak. Currently, tourists are longing for resuming the experience they used to enjoy during their previous visits.

Based on the information from other preceding researchers or specialists reported so far, the authors of this paper would like to propose guidelines to promote gastronomy tourism in Thailand after the Covid-19 pandemic. The promotion plan includes (1) components of gastronomy tourism, (2) types of gastronomy tourism, (3) guidelines for the development of gastronomy tourism in Thailand, and (4) measures of food service establishments for hygiene safety from COVID-19. The guidelines are to provide an effective approach to prevent the spread of the Covid-19 by hygiene safety measures to satisfy customers' needs and boost confidence in tourists when planning and selecting their gastronomy trips to Thailand. The guidelines integrate four considerations in the promotion plan into eight perspectives as follow:

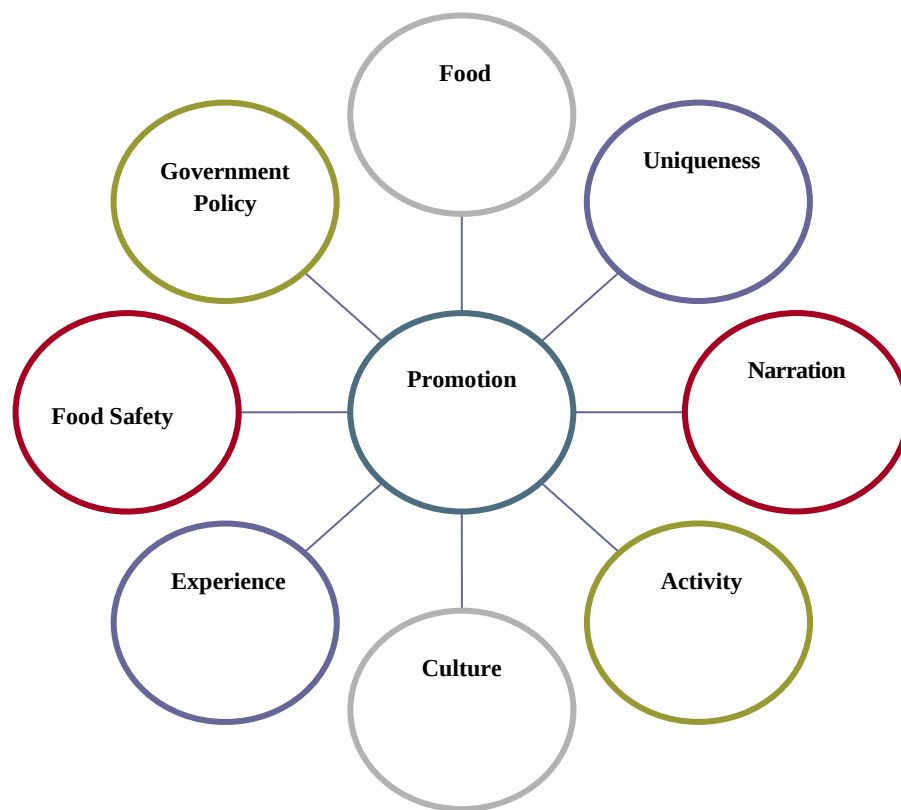
- (1) Nature of Thai food: the focus is on ingredients for health and outstanding presentation of dishes
- (2) Uniqueness: There are unique cultural stories related to Thai culture and the communities involved in growing herbal plants for ingredients and beautiful scenery of the local areas for herb gardens or plantations as tourist attractions.
- (3) Narration. Storytelling or food presentation creates a mood for tourists to feel indulged into the beauty and aroma of tasty dishes. Food stories are told by local people of the community concerned how special dishes were created to signify persons or celebrate festivities. All these can be communicated to potential customers and tourists via social media. Their shared photos and words of mouth by personal comments can further disseminate information on uniqueness of authentic Thai food experience to other potential gastronomy tourists.
- (4) Activity. Tourists enjoy learning local culture by visiting places or participating in various trips on the tour and local food activities according to their interests. Tourists tend to be interested in cooking activities as part of creative tourism.
- (5) Culture. Local communities can clearly reflect Thai culture and life with natural selling points in history, tradition, ways of daily life, and food preparation for cooking into delicious dishes as culinary identities of the community concerned.
- (6) Experience. Tourists are interested in gastronomy tourism from their past visit to gastronomy destinations and are curious to try new experiences to enrich their gastronomy solicitation.
- (7) Food Safety. Cleanliness of food is the first in priority to reduce contamination from various pathogens. Established cleanliness standards and systematic inspection of

food operators and food handlers to consumers are required to ensure meticulous measures of hygiene safety.

(8) Government Policy. The government's policy and its implementation on hygiene safety precautions for gastronomy tourism is a national agenda. This is to assist and support entrepreneurs, food service providers, and those food business operators in gastronomy tourism to gain public recognition and trust in hygiene safety measures as monitored by the authority concerned.

The researchers summarized the proposed guidelines for promoting gastronomy tourism in Thailand after the Covid-19 pandemic in Figure 1.

Figure 1: Guidelines for Promoting Gastronomy Tourism in Thailand after the Covid-19 Pandemic



9. Suggestions

The researchers have the following suggestions based on the proposed guidelines:

- (1) The guidelines for promoting gastronomy tourism in Thailand must be mutually justified by the government and the gastronomy tourism industry in terms of necessity to ensure tourists' safety for sustainable food business operations in creating both income and reputation for Thailand.
- (2) Gastronomy tourism in Thailand requires the government's clear-cut policy on food safety measures and a good system of follow-up inspections, including travel safety. Public relations can be done through social media that focus on specific groups of tourists from designated countries.
- (3) Gastronomy tourism activities need to be routed in a clear format, with calendars, seasons, events and festivals related to food variety in different areas of

Thailand. Scheduled public relations can help create tourists' awareness of the culinary events and food festivals throughout the year.

(4) Small food business entrepreneurs need support from the government for loans with low interest rates or loans free of interest for a specific period of time for their daily operations. They also need help with *online marketing for a digital distribution channel of value-added products and services* for effective contacts with their customers (Anukul & Singporn, 2020; Chamnanna, 2020).

With the proposed promotion guidelines and the given suggestions, the researchers expect that gastronomy tourism can definitely bring tourists back to Thailand to enjoy their unique culinary experience as desired in selecting Thailand as one of their favorite tourist destinations.

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ISSN 2730-2601

RICE Journal of Creative Entrepreneurship and Management, Vol.2, No.3, pp. 31-38,
September-December 2021

© 2021 Rajamangala University of Technology Rattanakosin, Thailand

doi: 10.14456/rjcm.2021.31

Received 16.07.21/ Revised 28.08.21/ Accepted 5.09.21

Stress Management at Workplace in Challenging Situations

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Abstract

Most employees worldwide have currently faced challenging situations in the workplace because of rapidly changing technology in their work environment and the outbreak of Coronavirus-19 since early 2020. These cause work-related stress to build up in unfamiliar work conditions, heavy workload, and employment insecurity. They need to adjust and learn to use new communication methods and tools, particularly virtual meetings as challenges for them to acquire digital skills to do their work at home as well as contact customers. These new work-related conditions have apparently increased employees' stress and anxiety. Stress problems cause poor mental health and fatigue as a sign of physical weakness. This is one of the most critical problems affecting employees' well-being and productivity in the workplace. The aims of this academic paper are (1) to define the meaning, concept and theory of stress, and (2) identify causes of stress in order to handle them efficiently. The author systematically reviewed relevant research and academic papers. It is expected that the results of the analysis and synthesis will shed light on the stress issues and stress management techniques for considerations of employees, organizational leaders, and human resource units to put stress at work at a manageable level. A little stress may be good for life and work productivity, but if it looms too large, it will certainly harm the organization and its productivity.

Keywords: *Stress, stress management, workplace, challenging situation, productivity*

1. Introduction

Due to disruptive technology and the outbreak of Coronavirus-19, these challenging situations have forced employees to work remotely, with a lack of balance between work and personal lives. A lot of employees have experienced stress more than ever before and increased the burnout level at work. The Department of Mental Health, Ministry of Public Health Thailand found that Thai people have stress levels increasing from 2.7% to 4.2% due to the COVID-19 outbreak (Voice online, 2021). Other researches showed that employees in organizations have high stress rates. They face many factors leading to stress, such as unrealistic expectations, a lack of work-life balance, tight deadline, uncertainty in career path, over workload, and decreased income and other benefits (Wongwassana, 2021). Stress also triggers mental and health problems, such as depression, heart disease, arrhythmias, and even sudden death (Chi & Kloner, 2003). In this regard, stress problems in the workplace have

impacts on employees' well-being, productivity, and the profitability of organizations (Manoj, 2013).

2. What Is Stress?

Stress is a nonspecific response of the body to a threat or danger which is a cause or result of something desirable or undesirable (Selye, 1936). It is a result of the relationship between the person and the external environment. The person assesses perceived external or internal demands and the perceived personal and social resources to deal with them. If the result is imbalanced, stress occurs; the person will feel threatened or harmed by unhappiness (Lazarus & Folkman, 1984). According to Beehr & Newman (1983), stress is a condition arising from the interaction between people and their jobs. It causes changes within people that force them to deviate from their normal functioning; so physical and mind are not in balance. It can be said that stress occurs when people feel their perceiving as being uncomfortable or cannot make decision at that moment, so manifesting physical or emotional imbalance. In the case of organizational change that demands innovations and personnel adjustments for the new patterns of work as in teamwork, a higher degree of collaboration, empowerment for decision making and needs to handle conflicts, employees involved will experience intense pressure to get their work done as expected by the organization (Sriboonnark, 2020 ; Ratchavieng, Srinet & Syers, 2021).

3. Level of Pressure

Employees often experience stress at different points in their lives. A low level of stress can help to motivate people to do something but too much stress will overwhelm and leave them with anxiety or anger, and hold them back to act properly. It has impact on day-to-day life. There is difference between positive stress (also known as “eustress”) and negative stress. When employees get a promotion or receive desirable things, hormones like endorphins, adrenaline, serotonin, and oxytocin are released to give pleasurable feelings. But when they get too much pressure or face bad situations, the stress hormone, cortisol will be released and linked to health effects, such as depression, troubled sleep, and overeating (Cording, 2020).

There is relation between the level of pressure and performance as shown in Figure 1 below. This figure shows the pressure performance curve with a bell-shaped trajectory. The curve serves as *a useful management tool* that can help employers and employees to understand and manage the pressure in their workplace in time.

Figure1: Level of Pressure and Performance

Source: Martin (2018)

The optimal level of stress can positively motivate employees to focus on their task and solve problems efficiently. If employees' stress occurs too often or exceeds the optimal level, it will cause physical and mental health problems, such as headache, strain, and burnout. Employees need to take care of their stress management and try to keep their pressure in the zones of comfort and stretch for the highest performance; they need to avoid pressure in the zone of strain and burnout for their physical and mental well-being.

4. Types of Stress

Employees' stress in the workplace arises from their reaction to demands of their abilities and knowledge that may not match the assigned jobs, or when attempting to get over pressure that exceeds their capability to deal it effectively. The American Psychological Association (APA) classified stress into three types--acute stress, episodic acute stress, and chronic stress (Ehrenfeld, 2018; Tran et al., 2020).

Acute stress: Acute stress is the most frequently occurred stress type; for example, when you cannot finish your work assignment in time. It happens in the short-term period and it may not have a full negative meaning, even though your heart might race and your blood pressure might rise. Acute stress helps to train and stimulate the development of brain in dealing with stressful situations in the future. It happens when a person reacts to upcoming situation or sudden challenges.

Episodic acute stress: Episodic acute stress occurs when people face regular stress or meet a crisis in their lives. For example, your boss poorly manages current tasks and often assigns an emergency job with a tight deadline. You may reduce stress by spending time for body exercise or planning about your finance in case you want to change job or resign from

work. If this stress cannot be reduced or solved in time, it will have possible impacts on your relationship with colleagues and family members, and consequently on your work productivity.

Chronic stress: Chronic stress is the most dangerous type of stress. It occurs when people face serious life and long-term problems. It can severely cause both physical and mental health problems.

All types of stress can lead to a variety of symptoms, but chronic stress can take a serious toll on the body over time. Understanding the three types of stress can help a person to have self-awareness and empathy for others who are under stress.

5. Signs and Symptoms of Workplace Stress

Stress is not always easy to perceive but there are some signs to show that employees might be experiencing too much pressure at work. Sometimes stress can come from an obvious source, or from even a small daily nuisance from the workplace. There are some common signs of stress, such as changes in mood, sweaty palms, difficult sleeping, digestive problems, feeling anxious, headaches, low energy, muscle tension, and heart rates (Scott, 2020). It can severely damage employees' physical and mental health.

6. Causes of Stress at Work

Causes of stress in the workplace can be categorized into two major types depending on the source of the cause (Panigrahi, 2016).

6.1 Internal causes

Internal causes involve a personal's mindset, attitude, and way of thinking. They come from within an individual and bring out stress. It also depends on an individual's perception when experiencing a difficult situation. In the same situation, each person has different perception. Some may feel that a person or a situation threatening to the extent of exerting pressure, even though there may not be a real or intense threat or danger existing in the surrounding.

6.2 External causes

External causes include many external factors in the organization which affect employees' performance and productivity which are:

- (1) Job insecurity. Employees may feel insecure at work. For example, they fear to lose their job, or face uncertain situations which are difficult to cope with. These can lead to chronic stress which causes a decline in work productivity.
- (2) Working hours. Long working hours lead to work stress and such physical problems as headaches and digestive issues, and mental problems, particularly tension, anxiety, anger and depression.

(3) Control at work. This refers to the extent of control employees have over their work. If employees have an insufficient level of control at work, they lose interest in their work and feel stressful to meet expectations of the superiors. An increasing level of control while empowering them to make decision can reduce stress among employees.

(4) Managerial style. The controlling style of managers affects stress among employees. Managers with a dictatorial leadership style have a strong grip on the planning and decision-making process for their employees. Managers with an autocratic style of leadership tend to make decisions alone, and cause their employees to feel stressful and powerless in making any decision on their work, and overwhelmed with work limitations.

(5) Overload and underload. Work overload means having many tasks to do in a very short time. A constant overload generates more stress and depression, and stressful employees cannot perform up to their job expectations. On the contrary, work under load could be as stressful as work overload in that underload consumes too much time for a small amount of work done. Such a condition can lead employees to doubt their capacity and feel bored and stressed over their low self-esteem. It can become a silent killer of team productivity.

(6) Behavioral changes. Sometimes, situations happen to ask employees to change their normal behavior. They may feel uncomfortable because such a forced change can lead to stress and its impact on work productivity and job efficiency.

7. Coping with Stress

Stress management includes thoughts, emotions, planning, and methods to deal with problems. The first in priority is to identify sources of stress. Sometimes, it is difficult for employers and employees to know the true cause of stress so that they can reflect upon their thoughts, feeling, and behaviors for possible adjustments in reducing the level of stress. It should be noted that they may find their stress not from their job but perhaps from personal matters.

Some people use unhealthy habits to cope with stress, such as smoking, gambling, shopping, drinking alcohol, or overeating. These may help reduce stress in a short period of time, while still keeping the actual sources of stress. Moreover, they can lead to new kinds of problems and even more stress in the future. On the other hand, healthy coping habits, such as body exercise, outdoor activities, being with nature, keeping pets, consulting assistance for troubled spouses or trusted friends. These ways can keep them at the present moment and give an opportunity to solve problems at the roots of stress-related problems (Martin, 2020).

Scott (2021) suggested two main strategies to help people at work to cope with stress: solution-based coping and appraisal-based coping.

(1) Solution-based coping with stress. When using solution-based coping strategies with stress, people must identify areas of their lives which can be

changed, create a plan and take action on the plan that will bring about change. This strategy includes eliminating stressors, such as quitting a stressful job, avoiding a toxic colleague, managing a busy schedule, or finding a means to eliminate stress before encountering more of it. However, some stressful situations cannot easily make changes or eliminate the stressors; for example, it is necessary to work with a difficult boss and colleagues to get the job done.

(2) Appraisal-based coping with stress. This strategy of coping with stress involves how people feel about their stressors. They must ask themselves when experiencing the challenging situation whether it really causes stress or it is simply part of life. Trying to find humor or a positive aspect of a stressful situation could be a possible solution for some who could manage and tolerate stress.

Kelly Yang, Ph.D., Harvard and Berkeley-trained researcher and NY Times bestselling author suggests three steps in coping with stress (Cording, 2020):

- (1) Assessing stress by listing everything which is its source. This should include both professional and personal spheres. It is important to evaluate and circle the biggest stressors on the list.
- (2) Making a plan and asking others for support to reduce stressors. For example, try to communicate and negotiate with the leader or partner in extending the timeline of the project when faced with the crisis situation.
- (3) Changing daily habits. It may help a person to manage stress even though no one can prevent all stressors from happening. Useful habits in managing stress could include mindful practice like meditation, making routine body exercise, eating health food and releasing suppressed emotions via music.

Employees should try new and suitable coping strategies to reduce their stress in the workplace. There are many stress-coping methods, particularly fitness activity and mindfulness training. Jarukasemthavee (2020), Professor of Faculty of Psychology, Chulalongkorn University proposes practical guidelines for mind care to help reduce stress in that Thai people need to observe their thoughts, feelings and physical symptoms. They can use psychological relaxation and breathing exercise for at least 5 minutes to calm the mind in the morning, noon, and evening. Moreover, people need to reduce access to information that provokes high anxiety. Scott (2019) also suggests the breathing exercise for 5 minutes when faced with the stressful situation. Such a method can work quickly and be easily used anywhere and in any situation. There is no need to take a complete break from stress-related agents. If employees choose a suitable strategy to manage stress, it can help reduce stress for adaptation to a sound working life.

As an organization, employers should beware that their employees' mental health issues deserve immediate attention. Employees are the most important resource of the organization. They should have a healthy body and mind to be able to work productively. Jim

Falteisek (BusinessToday, 2021), Vice President of 3M Asia Corporate Affairs suggests one strategy to manage stress and mental health problems for workers to grapple with stress from the Covid-19 outbreak. Employees are advised to open up and talk about their mental health struggles they have not encountered before by being honest, transparent and open to their leader and colleagues. Such actions will help remove any obstacles when encountered at work. No one should struggle with mental health problems alone. Moreover, 3 M Company has Employee Assistance Program (EAP) which supports employees throughout their career. The objective of this program is to help employees to cope with stress and anxiety in difficult situations in all aspects of work and life (BusinessToday, 2021).

8. Conclusion

In such a challenging situation as the Coronavirus-19 pandemic, most employees have to face more stressors which lead to the higher level of stress. They may have personal, professional, and financial anxieties, but both employers and employees in the organization need to realize the impact of stress. When employees experience stress, they need to manage and reduce it as soon as possible. On the part of employers, they need to help remove obstacles or stressors for employees for the latter's overall well-being and productivity they can create for their organization.

9. The Author

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ISSN 2730-2601

RICE Journal of Creative Entrepreneurship and Management, Vol.2, No.3, pp. 39-53,

September-December 2021

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doi: 10.14456/rjcm.2021.35

Received 7.09.21/ Revised 15.09.21/ Accepted 26.09.21

Climate Change and Nam Dok Mai Mango Yield: A Process Management

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Abstract

Climate change affects plants and animals which need to adapt themselves to environmental changes. Nam Dok Mai mango (science name as *Mangifera indica* Linn) is one of the important economic crops in Thailand and it is also affected by climate change. In this research, the relationship in terms of *correlation* between climate and Nam Dok Mai mango yield was explored. The cultivation areas of Nam Dok Mai Mango in the eastern, northeastern, and northern regions were studied. Climate and diseases in the growers' orchards in these three areas were measured and collected in three phases: (1) flowering to fruit setting, (2) fruit setting to bagging, and (3) bagging to harvesting. Mango yields and qualities were measured and collected in the harvesting phase. The study results reveal that climate in the off-season crops has a great effect on mango yields and mango qualities than the on-season crops. The obtained findings were expected to benefit improvement in the production process management to reduce side effects from climate change and increase mango yields with good qualities.

Keywords: *Nam Dok Mai mango yield, climate change, correlation coefficient, production process management*

1. Introduction

Mangoes are one of the important economic crops of Thailand. The Office of Agricultural Economics (Kidsang, 2019) reported that Thailand has planted nearly 320,000 hectares of mangoes since 2016. The top five mango cultivation provinces are Phitsanulok, Chiang Mai, Prachuap Khiri Khan, Suphan Buri, and Phetchabun. Mangoes can be produced all year round and there are mango yields to the market throughout the year. However, the month with the highest yield is April. The strength of mango production in Thailand is that the production can be off season, but the crops are affected in quality from diseases.

Nam Dok Mai Mango is a major export crop currently exposed to climate change. Most of the effects stemmed from elevated temperatures, drought, dry spells, too much rain, and humidity fluctuation at the start and the end of the season (Boonpradub, 2015). These aspects affect mango growth, yield, and quality, as seen in a rapid increase in pests and diseases. In addition, high temperature and severe drought accelerate flowering to occur faster than usual. As a result, the blooming period of mango flowers does not correspond with the pollination period of insects—leading to less fruiting.

In this research, the impact of climate on growers' production process management was investigated by finding the correlation coefficient between climate and mango yields to identify factors affecting mango yields and their qualities. The study results will be used to adjust the management process of Nam Dok Mai Mango production to reduce the effects of climate change. The study also aimed to identify the best practice of the management process that can avoid or reduce the damage on mango yield caused by climate change in the case of Nam Dok Mai mango as well as the other mango types.

2. Literature Review

The effect of climate change on mango production was studied by Worasathit et al (2020). The researchers investigated the area of mango cultivation in Khon Kaen Province which is in the northeast region of Thailand. The results of the study pointed to climate change affecting the flowering and fruit development phases of mangoes in the crop season. The research covered development of mango flowering in 2014 and 2015 with temperatures below 20 degrees Celsius from 15 September to 25 November 2014, and 6 December 2014 to 15 February 2015. However, rainfall in February and March 2015 caused the development of peduncles into leaves. High temperature and rain caused the flowers and inflorescences to drop. The researchers also found that climate change had impacts on insect infestations. Although growers tried to maintain and prevent diseases and insects, they were not able to protect mangoes against pests and insects in arid environments. Growers adapted their cultivations to climate change by producing mango off season instead. The off-season crops mean more profits (Sukiam et al., 2020) and they have to adjust production as an innovation in changing their management process (Sriboonnark, 2020). Therefore, the pruning phase was postponed to February to allow the flowering period to correspond with the cold weather. However, this caused mango trees to encounter the hot weather in April. Growers solved this problem by using nets to shade mango trees. The net was found to help ease up the fruit setting phase.

In this study, the researchers explored the relationship between climate and Nam Dok Mai Mango yields by values of correlation coefficient. Taylor (1990) put Equation 1 for analyzing the relationship between two or more variables to find whether they are related or not.

$$\text{Correlation coefficient } (r) = \frac{\sum xy - n\bar{x}\bar{y}}{\sqrt{\sum xi^2 - n\bar{x}^2} \sqrt{\sum yi^2 - n\bar{y}^2}} \quad (1)$$

where n = number of samples, $\bar{x}$ = average of x variable, $\bar{y}$ = average of y variable.

The interpretation of correlation coefficient r is as follows:

- If r is a positive number, it means x and y have direct relationship. If value of x variable increases, then value of y variable will also increase.
- If r is a negative number, it means x and y have inverse relationship. If value of x variable increases, then value of y variable will decrease.
- If r is zero, it means x and y are not associated.
- If absolute of r or $|r|$ is closer to one, then x and y are closely related.
- If $|r|$ is closer to zero, then x and y are less correlated.

3. Research Objective

The research objective of this study was to use correlation coefficients to find the degrees of relationship between climate and Nam Dok Mai mango yields and qualities.

4. Research Methodology

This research examined the correlation coefficient between climate and Nam Dok Mai Mango yields as crops on season and off season. The cultivated areas in the study were divided into two sets. The first area consisted of mango orchards in two provinces--Sa Kaeo, Chachoengsao, and Nakhon Ratchasima. Growers in the first area produced mangoes both on season and off season. The on-season crop of the first area was from November to May and the off-season crop from June to November. The second area covered mango orchards in four provinces--Phichit, Phitsanulok, Phetchabun, and Chiang Mai pro. Growers in the second area produced mangoes only on season from October to May.

The research was conducted in three stages:

- (1) Collecting data on climate and diseases,
- (2) Gathering data on mango yields and mango qualities, and
- (3) Finding correlation coefficients between climate and mango yields.

4.1 Collecting Data on Climate and Diseases

Factors affecting mango yields were studied and collected as follows: temperature, relative humidity, and disease. These factor data were divided into two sets: on-season and off-season crops. Data of each season were divided into 3 phases: (1) flowering to fruit setting, (2) fruit setting to bagging, and (3) bagging to harvesting.

For each mango orchard, diseases were collected for the whole season and the average percent of diseases for all mango trees in each orchard was computed. Temperature and relative humidity were measured and collected every day for each phase and the following data were computed:

- (1) Daily temperature and relative humidity values were averaged.
- (2) Maximum daily temperature and relative humidity values were averaged.
- (3) Minimum daily temperature and relative humidity values were averaged.
- (4) Different maximum and minimum for daily temperature and relative humidity values were averaged.

The climate and disease data for on-season and off-season crops are displayed in Tables 1 and 2, respectively.

4.2 Gathering Data on Mango Yields and Product Qualities

Mango yields and mango qualities were collected by the end of the third phase. The product qualities were divided into 6 variables: (1) grade A, (2) grade B, (3) weight, (4) specific gravity, (5) Total Soluble Solid (TSS), and (6) Titratable Acidity (TA).

Mango grades are defined by the Office of Agricultural Economics (2021) as follows:

- (1) Mangoes classified as grade A must have weight between 300 and 600 gram and their skin must not have blemish by insects.
- (2) Mangoes classified as grade B must have weight between 200 and 299 grams and their skin must not have blemish by insects.

According to Wongkhot, Rattanapanone, & Chanasut (2012), the specific gravity is used to measure starch in fruit. The specific gravity of fruit depends on its species including maintenance during planting. If a fruit has a high specific gravity, it shows that there is a large amount of starch. This will result in the fruit being very sweet. The relationship between TSS and TA is also used to measure fruit sweetness. If TSS value is large and TA is small, it indicates that a fruit is very sweet.

The mango yields and qualities for both on-season and off-season crops are presented in Table 3.

4.3 Finding Correlation Coefficients between Climate and Mango Yields

Python programming language was used to find correlation coefficients between climate, diseases, mango yields, and mango qualities. The function named `data_corr()` in pandas library (The Pandas Development Team, 2021) was used to calculate correlation coefficients. The formula in Equation 1 is used in the `data_corr()` function to find the correlation coefficients. The results were later generated in the form of graphs. The numpy (The NumPy community, 2021) and matplotlib (Matplotlib development team, 2021) libraries were used to generate graphs of correlation coefficient results. The Python codes are displayed in Figure 1 as described below:

- (1) Steps 1-3: Import pandas, numpy, and matplotlib libraries.
- (2) Step 4: Define user function named find_corr(in_file), where in_file is an input parameter of the function. The in_file is a file name containing data with CSV file format to find correlation coefficient.
- (3) Step 5: Read data stored in the in_file to keep in the variable named "data."
- (4) Step 6: Call function named data_corr() to calculate correlation coefficient and stored results in a variable named corr.
- (5) Step 7-17: Convert correlation coefficient results stored in the variable named corr into a graph.
- (6) Step 18-23: Each step is used to call the function named find_corr(in_file) to execute. The find_corr(in_file) function generates correlation coefficient graph of following CSV input file:
 - a. The on_season_yields_phase1.csv stores climate and mango yield data of the first phase of on-season crop.
 - b. The on_season_yields_phase2.csv stores climate and mango yield data of the second phase of on-season crop.
 - c. The on_season_yields_phase3.csv stores climate and mango yield data of the third phase in of on-season crop.
 - d. The off_season_yields_phase1.csv stores climate and mango yield data of the first phase of off-season crop.
 - e. The off_season_yields_phase2.csv stores climate and mango yield data of the second phase of off-season crop.
 - f. The off_season_yields_phase3.csv stores climate and mango yield data of the third phase of off-season crop.

Table 1: Climate and Disease Data for the On-season Crop

	T AVG (C)	T MAX (C)	T MIN (C)	T (MAX-MIN) (C)	RH AVG (%)	RH MAX (%)	RH MIN (%)	RH (MAX-MIN) (%)	Disease (%)
On-season: the 1st Phase of Flowering to Fruit Setting									
1	27.81	32.04	22.03	10.01	51.82	58.34	38.22	20.12	3.13
2	27.81	32.04	22.03	10.01	51.82	58.34	38.22	20.12	3.23
3	27.81	32.04	22.03	10.01	51.82	58.34	38.22	20.12	6.45
4	26.83	27.87	25.10	2.77	74.97	81.95	69.95	12.00	0.00
5	26.83	27.87	25.10	2.77	74.97	81.95	69.95	12.00	6.45
6	26.83	27.87	25.10	2.77	74.97	81.95	69.95	12.00	6.45
7	27.03	30.15	20.95	9.20	71.24	82.32	43.98	38.34	6.67
8	27.88	24.05	19.33	4.72	57.41	63.55	51.68	11.87	0.00
9	27.88	24.05	19.33	4.72	57.41	63.55	51.68	11.87	0.00
10	27.88	24.05	19.33	4.72	57.41	63.55	51.68	11.87	6.06
11	29.31	24.21	18.39	5.82	59.82	68.02	52.04	15.98	0.00
12	29.31	24.21	18.39	5.82	59.82	68.02	52.04	15.98	3.33
13	29.31	24.21	18.39	5.82	59.82	68.02	52.04	15.98	0.00

	T AVG (C)	T MAX (C)	T MIN (C)	T (MAX-MIN) (C)	RH AVG (%)	RH MAX (%)	RH MIN (%)	RH (MAX-MIN) (%)	Disease (%)
On-season: the 2nd Phase of Fruit Setting to Bagging									
1	29.68	35.56	27.83	7.73	57.28	61.61	41.75	19.86	3.13
2	29.68	35.56	27.83	7.73	57.28	61.61	41.75	19.86	3.23
3	29.68	35.56	27.83	7.73	57.28	61.61	41.75	19.86	6.45
4	28.69	32.38	24.13	8.25	73.41	93.15	44.07	49.08	0.00
5	28.69	32.38	24.13	8.25	73.41	93.15	44.07	49.08	6.45
6	25.69	30.15	19.61	10.54	71.96	82.32	43.98	38.34	6.45
7	26.42	28.25	21.49	6.76	66.83	82.29	51.61	30.68	6.67
8	24.22	26.41	21.51	4.90	51.75	60.35	43.94	16.41	0.00
9	24.22	26.41	21.51	4.90	51.75	60.35	43.94	16.41	0.00
10	24.22	26.41	21.51	4.90	51.75	60.35	43.94	16.41	6.06
11	24.40	27.18	21.98	5.20	54.59	62.30	43.87	18.43	0.00
12	24.40	27.18	21.98	5.20	54.59	62.30	43.87	18.43	3.33
13	24.40	27.18	21.98	5.20	54.59	62.30	43.87	18.43	0.00
On-season: the 3rd Phase of Bagging to Harvesting									
1	29.50	32.82	25.98	6.84	53.14	61.94	48.71	13.23	3.13
2	29.50	32.82	25.98	6.84	53.14	61.94	48.71	13.23	3.23
3	29.50	32.82	25.98	6.84	53.14	61.94	48.71	13.23	6.45
4	34.14	37.75	28.04	9.71	65.83	79.63	51.93	27.70	0.00
5	34.14	37.75	28.04	9.71	65.83	79.63	51.93	27.70	6.45
6	27.40	30.23	23.98	6.25	57.62	65.42	46.79	18.63	6.45
7	27.42	32.23	23.98	8.25	55.93	65.42	46.79	18.63	6.67
8	28.78	32.65	25.30	7.35	44.63	77.08	33.36	43.72	0.00
9	28.78	32.65	25.30	7.35	44.63	77.08	33.36	43.72	0.00
10	28.78	32.65	25.30	7.35	44.63	77.08	33.36	43.72	6.06
11	28.11	31.64	25.11	6.53	50.70	80.25	38.18	42.07	0.00
12	28.11	31.64	25.11	6.53	50.70	80.25	38.18	42.07	3.33
13	28.11	31.64	25.11	6.53	50.70	80.25	38.18	42.07	0.00

T = Temperature, C = Celsius, AVG = Average, RH = Relative Humidity

Table 2: Climate and Disease Data for the Off-season Crop

	T AVG (C)	T MAX (C)	T MIN (C)	T (MAX-MIN) (C)	RH AVG (%)	RH MAX (%)	RH MIN (%)	RH (MAX-MIN) (%)	Dis- ease (%)
Off-Season: the 1st Phase of Flowering to Fruit Setting									
1	27.77	28.88	26.13	2.75	94.27	97.86	89.73	8.13	15.09
2	27.77	28.88	26.13	2.75	94.27	97.86	89.73	8.13	16.00
3	35.49	37.37	32.24	5.13	87.09	99.33	76.36	22.97	18.00
4	26.99	29.59	24.34	5.25	70.33	83.86	61.95	21.91	21.62
5	22.20	24.22	19.93	4.29	94.61	99.79	88.74	11.05	5.88

	T AVG (C)	T MAX (C)	T MIN (C)	T (MAX-MIN) (C)	RH AVG (%)	RH MAX (%)	RH MIN (%)	RH (MAX-MIN) (%)	Dis- ease (%)
Off-Season: the 2nd Phase of Fruit Setting to Bagging									
1	28.40	29.94	26.42	3.52	89.28	98.07	81.65	16.42	15.09
2	28.40	29.94	26.42	3.52	89.28	98.07	81.65	16.42	16.00
3	36.36	44.13	29.38	14.75	82.94	99.90	32.07	67.83	18.00
4	25.68	29.47	21.09	8.38	61.16	66.65	46.99	19.66	21.62
5	21.24	25.71	15.66	10.05	90.16	96.73	77.92	18.81	5.88
Off-Season: the 3rd Phase of Bagging to Harvesting									
1	26.04	29.47	21.09	8.38	62.50	76.14	46.99	29.15	15.09
2	26.04	29.47	21.09	8.38	62.50	76.14	46.99	29.15	16.00
3	34.08	37.18	27.54	9.64	80.01	99.86	66.35	33.51	18.00
4	30.10	33.30	27.87	5.43	72.59	91.78	47.90	43.88	21.62
5	24.08	28.00	15.87	12.13	88.35	95.31	83.02	12.29	5.88

T = Temperature, C = Celsius, AVG = Average, RH = Relative Humidity, SG = Specific Gravity.

Table 3: Nam Dok Mai Mango Yields and Qualities for both On-season and Off-season Crops

	Grade A (%)	Grade B (%)	Weight (g)	SG	TSS (%Brix)	TA (%)		Grade A (%)	Grade B (%)	Weight (g)	SG	TSS (%Brix)	TA (%)
On-season							Off-Season						
1	78.13	21.88	356.11	1.03	21.36	0.42	1	64.15	35.85	312.45	1.02	17.48	0.87
2	87.10	12.90	417.50	1.03	22.61	0.42	2	53.33	46.67	376.26	1.01	17.03	0.96
3	64.52	35.48	337.91	1.02	18.88	0.36	3	88.00	12.00	298.34	1.04	18.88	0.55
4	84.38	15.63	327.88	1.30	16.61	0.49	4	72.97	27.03	352.24	1.02	21.56	0.45
5	83.87	16.13	350.95	1.02	17.99	0.54	5	79.41	20.59	215.19	1.04	20.27	0.66
6	87.10	12.90	307.62	1.02	17.06	0.48							
7	83.33	16.67	352.69	1.03	20.21	0.67							
8	36.36	63.64	356.32	1.02	19.01	0.53							
9	74.29	25.71	309.22	1.03	17.84	0.35							
10	84.85	15.15	429.32	1.02	16.22	0.24							
11	97.14	2.86	292.95	1.01	16.96	0.22							
12	93.33	6.67	358.08	1.01	16.93	0.19							
13	73.68	26.32	277.06	1.01	16.50	0.27							

g = gram, SG = Specific Gravity

Figure 1: Python Codes for Computing Correlation Coefficients

```

import pandas as pd                                     #1
import numpy as np                                     #2
import matplotlib.pyplot as plt                         #3

def find_corr(in_file):                                #4

    data = pd.read_csv(in_file, index_col=0)            #5
    corr = data.corr()                                 #6

    fig = plt.figure()                                 #7
    ax = fig.add_subplot(111)                           #8
    cax = ax.matshow(corr, cmap='binary', vmin=-1, vmax=1) #9
    fig.colorbar(cax)                                   #10
    ticks = np.arange(0, len(data.columns), 1)          #11
    ax.set_xticks(ticks)                                #12
    plt.xticks(rotation=90)                             #13
    ax.set_yticks(ticks)                                #14
    ax.set_xticklabels(data.columns)                    #15
    ax.set_yticklabels(data.columns)                    #16
    plt.show()                                           #17

find_corr('on_season_yields_phase1.csv')                #18
find_corr('on_season_yields_phase2.csv')                #19
find_corr('on_season_yields_phase3.csv')                #20

find_corr('off_season_yields_phase1.csv')                #21
find_corr('off_season_yields_phase2.csv')                #22
find_corr('off_season_yields_phase3.csv')                #23

```

5. Experimental Results

The Python code in Figure 1 was executed and the results are displayed in Figures 2 to 7.

Figures 2 and 3 show the results of correlation coefficients of the flowering to fruit setting phase in the on-season and off-season crops, respectively. The results indicate that:

- (1) Difference in temperature and relative humidity in the off-season crop have a greater effect on Grade A yield than the on-season crop, but opposite with grade B yield.
- (2) Average temperature, maximum temperature, and minimum temperature in the off-season crop has greater effect on mango weight than the on-season crop.

Figure 4 and 5 show the results of correlation coefficients of the fruit setting to bagging phase in the on-season and off-season crops, respectively. The results indicate that:

- (1) Average temperature, difference in temperature and relative humidity in the off-season crop have a greater effect on Grade A yield than the on-season crop.

Minimum relative humidity in the off-season crop has a great effect on Grade B yield.

(2) Average temperature and minimum temperature have a great effect on mango weight in the off-season crop.

Figure 6 and 7 show the results of correlation coefficients of the fruit bagging to harvesting phase in the on-season and off-season crops, respectively. The results indicate that:

(1) Climate has little effect on mango weight, and grade A and grade B yields in the on-season crop. Average temperature, maximum temperature, average relative humidity, maximum relative humidity, and minimum relative humidity have a great effect on grade A yield in the off-season crop, but opposite with grade B yield.

(2) Average temperature, maximum temperature, and minimum temperature have an effect on mango weight in the off-season crop.

Temperature in the off-season crop has a greater effect on diseases than the on-season crop. High temperature and relative humidity in both on-season and off-season crops have a great effect on sweetness of mangoes.

(1) Temperature and humidity have less effect on grade A yield, grade B yield, and mango weight in the on-season crop. Temperature and humidity have a great effect on grade A yield in the off-season crop, but opposite with grade B yield.

(2) Average temperature, maximum temperature, and minimum temperature have a great effect on mango weight in the off-season crop.

(3) High temperature, low humidity and difference of humidity have an effect on disease in the off-season crop.

(4) High temperature and high relative humidity in the off-season crop results in increased starch.

Figure 2: Correlation Coefficients between Climate and Nam Dok Mai Mango Yields of the Flowering to Fruit Setting Phase in the On-season Crop

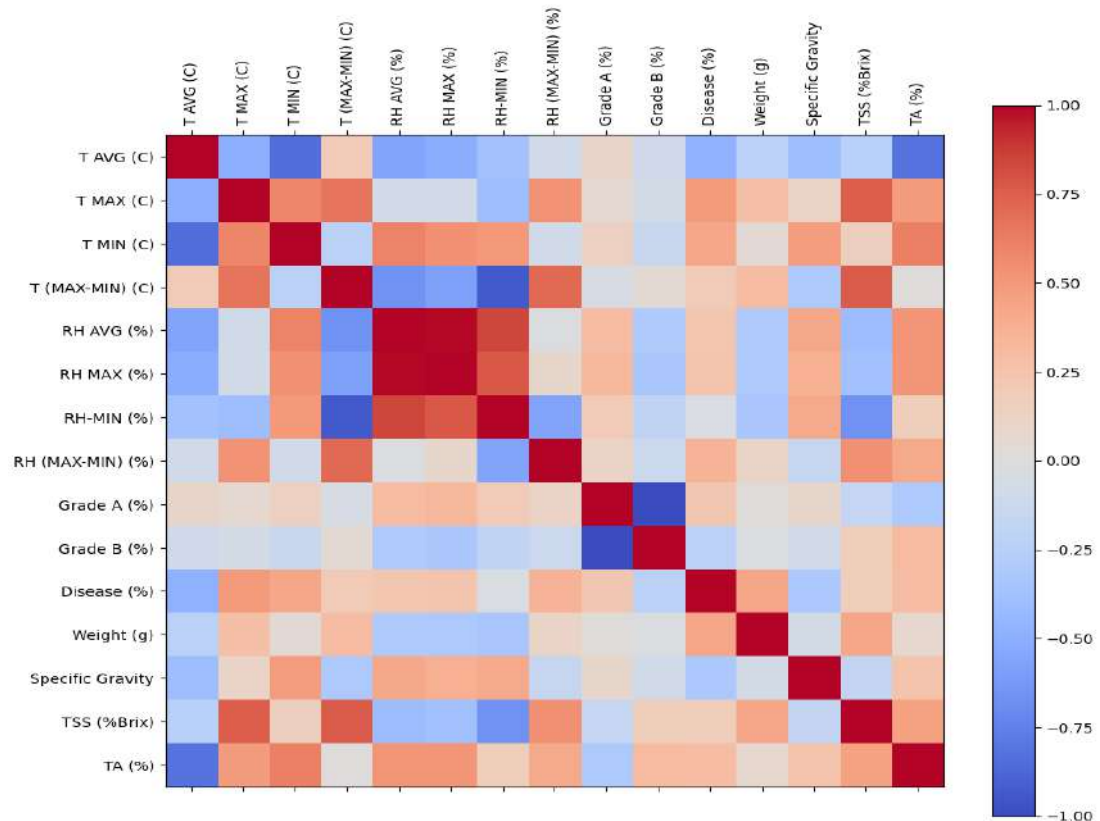


Figure 3: Correlation Coefficients between Climate and Nam Dok Mai mango Yields of the Flowering to Fruit Setting Phase in the Off-season Crop

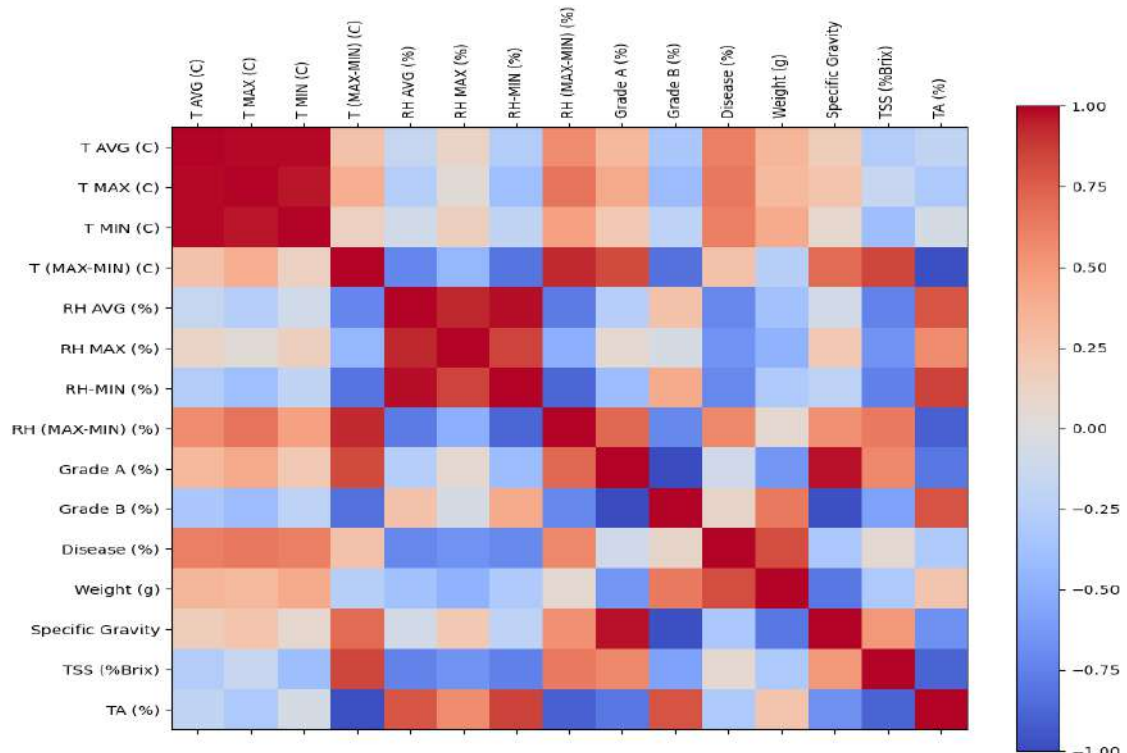


Figure 4: Correlation Coefficients between Climate and Nam Dok Mai Mango Yields of the Fruit Setting to Bagging Phase in the On-season Crop

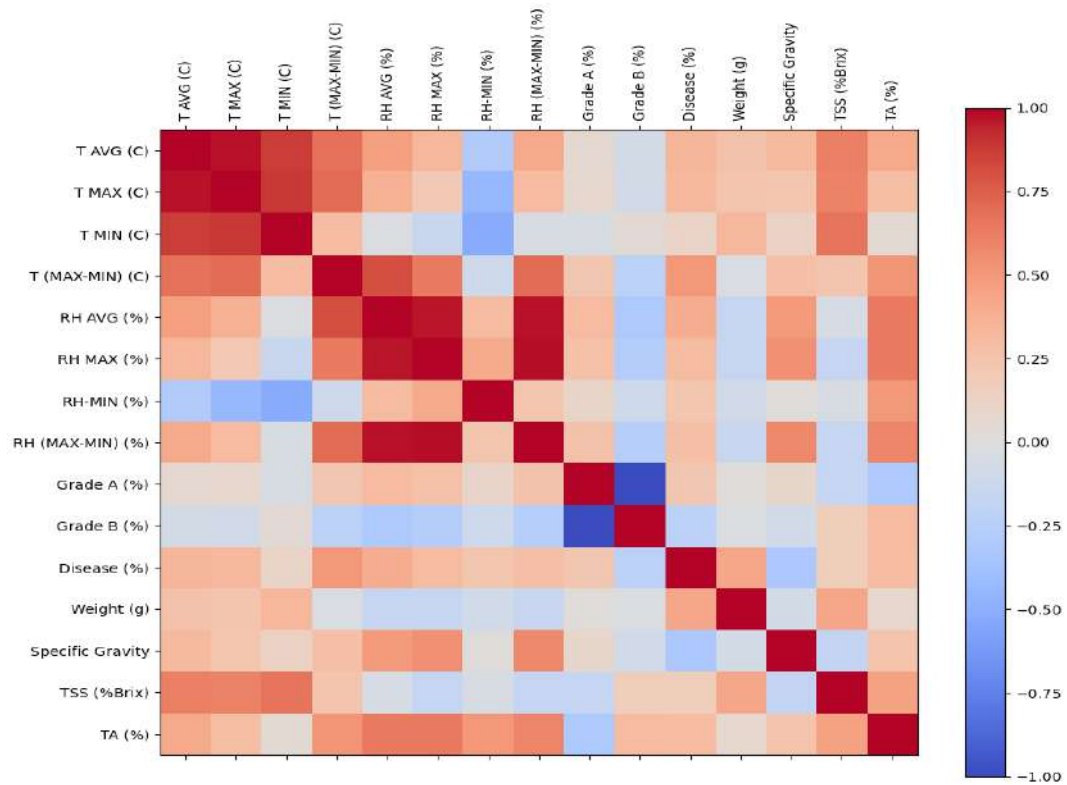


Figure 5: Correlation Coefficient between Climate and Nam Dok Mai Mango Yields of the Fruit Setting to Bagging Phase in the Off-season Crop

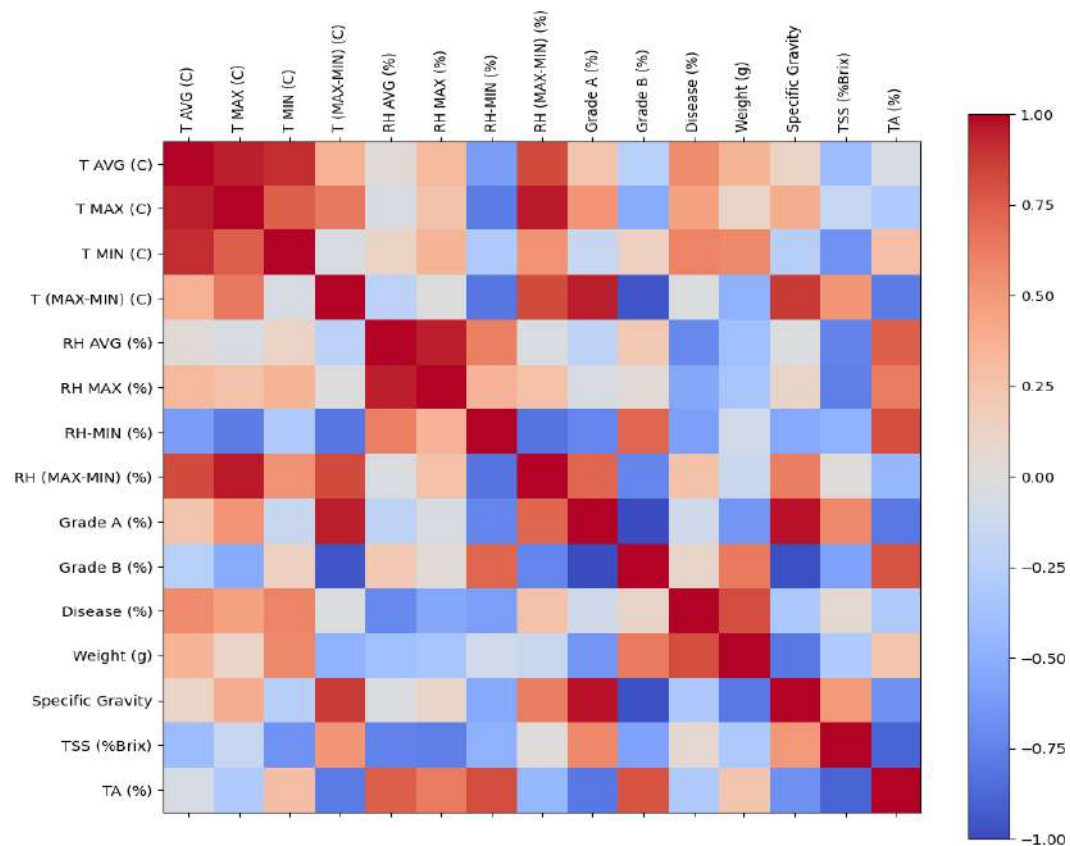


Figure 6: Correlation Coefficients between Climate and Nam Dok Mai Mango Yields of the Bagging to Harvesting Phase in the On-season Crop

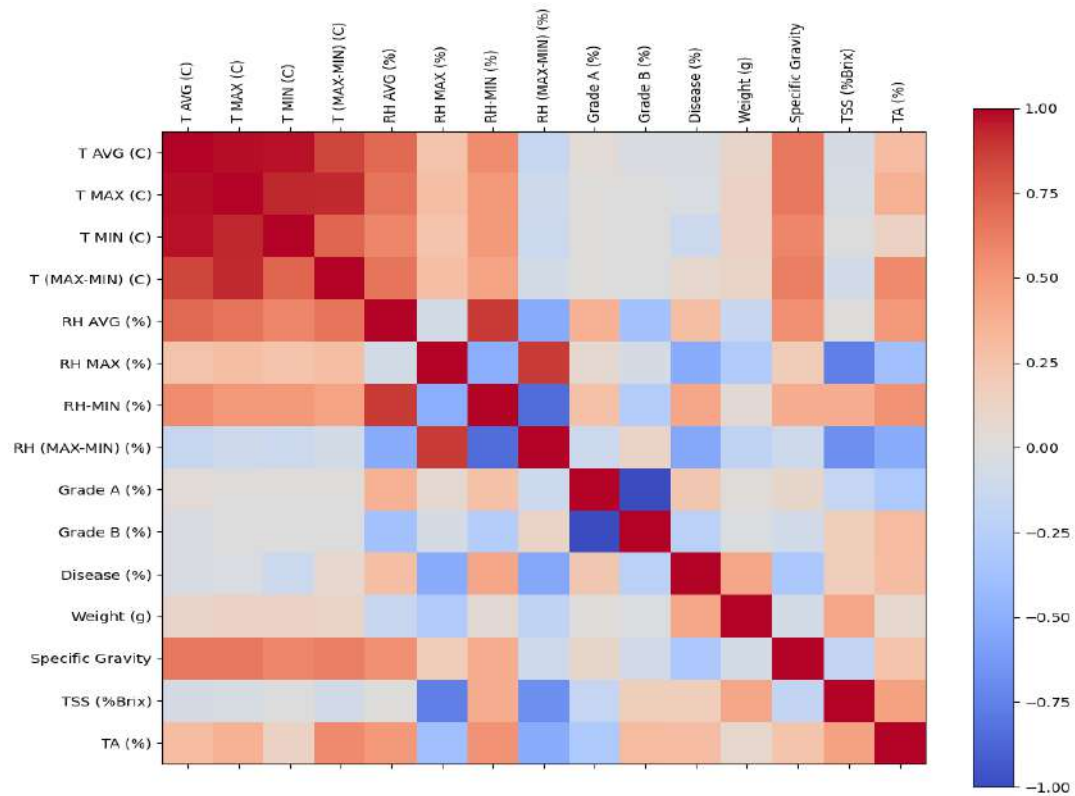
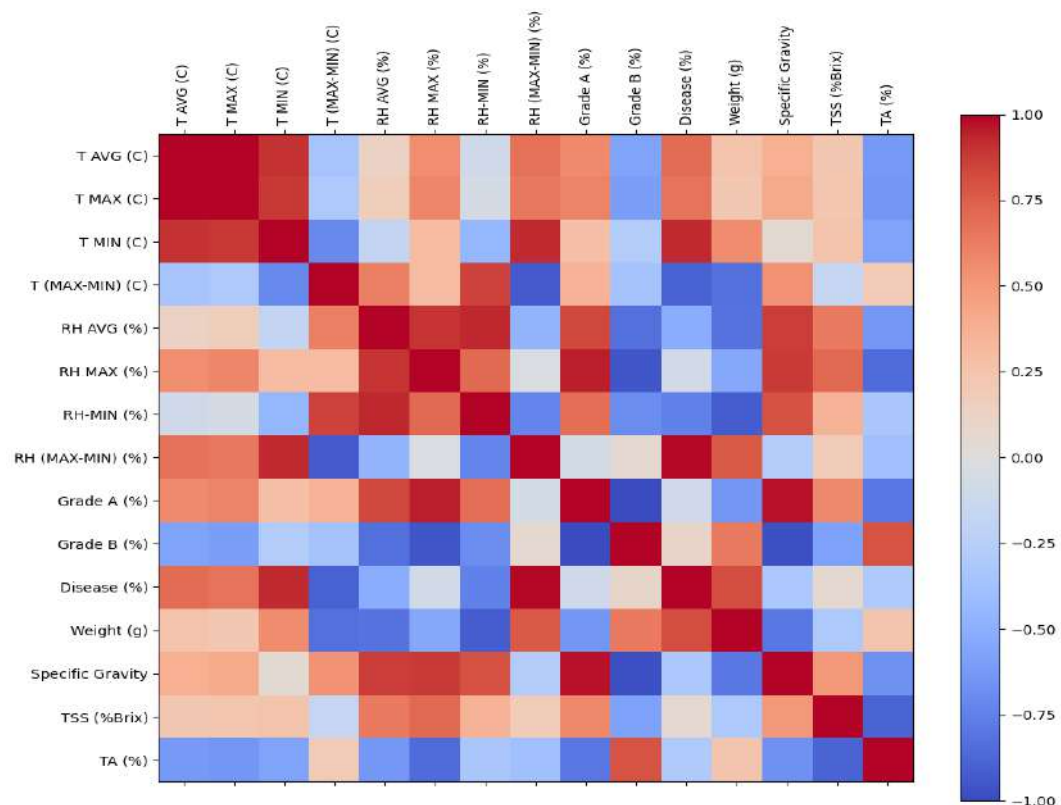


Figure 7: Correlation Coefficients between Climate and Nam Dok Mai Mango Yields of the Bagging to Harvesting Phase in the Off-season Crop



6. Discussion and Conclusion

The correlation coefficient was applied to find relationship between climate, diseases, mango yields, and mango qualities in both the on-season and off-season crops. The climate and mango yields were measured and collected from the selected mango orchards in three regions with differences in climate: eastern, northeastern, and northern. The results revealed that mango yields and their qualities produced off season are highly correlated with temperature and relative humidity than those on season. Temperature off-season has a greater effect on diseases than that on season. High temperature and relative humidity both on season and off season have a great effect on mango starch.

The results of the studies are vitally important to the production process management of off-season mango yields. The correlation coefficient results can be used to manipulate mango orchards in the production process to increase mango yields and improve mango qualities. The researchers have planned to conduct a further study in the following year to identify the side effects of climate change to be avoided or reduced in two cases: (1) If the production phase needs low temperature at the time of very high temperature, to what extent should the growers use shading nets to cover mango trees to reduce temperature? And (2) If the production process requires relatively high humidity amidst drought, to what extent should the growers use sprinklers for a required relative humidity? The results to be obtained from further studies are expected to generate a useful guideline for Nam Dok Mai Mango growers to increase efficiency in their off-season production process management in terms of yield and quality.

7. Acknowledgements

The researchers are grateful to Biodiversity-Based Economy Development Office (BEDO), Bangkok, Thailand, for the budget in support of the Research Project.

Our sincere thanks are for Associate Professor Dr. Ruja Pholsward for her initial feedback to the draft of this paper.

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ISSN 2730-2601

RICE Journal of Creative Entrepreneurship and Management, Vol.2, No.3, pp. 54-68,

September-December 2021

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doi: 10.14456/rjcm.2021.32

Received 17.08.21/ Revised 26.08.21/ Accepted 6.09.21

Acculturation and Life Satisfaction of Yi Villagers in China: A Survey Based on Different Yi Ethnic Branches

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Abstract

There are many Yi branches with different cultural characteristics in China. In this study, the researchers chose by stratified sampling a total of 522 Yi villagers from different branches to investigate their acculturation and life satisfaction. The results showed that: (1) the acculturation strategies of Yi villagers were mainly integrated, followed by separation, and a small part of assimilation and marginalization; (2) the acculturation of different Yi branches showed a trend from separation to integration, and then assimilation and marginalization after complete contact; (3) the acculturation of Yi villagers is significantly related to individual gender, age, education, income, and marital status; and (4) both the Yi acculturation attitude and the mainstream acculturation attitude have a significant positive predictive effect on life satisfaction. Therefore, the government should adhere to and strategically adjust the policy of regional autonomy, increase the investment in primary education, develop the economy, and break down the within-group marriage habits to improve the acculturation of the Yi villagers.

Keywords: *Acculturation, life satisfaction, Yi ethnic, Yi branch*

1. Introduction

China is a multi-ethnic country, and ethnic minority residents often appear as culturally disadvantaged groups in cross-cultural contact. When the original culture collides with the mainstream culture, they will generally face acculturation due to the differences between different cultures (Liu, 2020). Among the numerous studies on the acculturation of ethnic minorities, there is almost no study on the adult villagers of Yi. Yi is an ancient ethnic group in China. Despite the long historical changes in the past, Yi still has retained its unique traditional culture and religious belief. However, with the rapid development of China's economy, especially in recent years with poverty alleviation and new rural construction, these traditional Yi societies are undergoing rapid changes. In the process of contact with the mainstream ethnic group, the traditional Yi residents are not

adapted to it, which is reflected in the separation or marginalization of the Yi individual and the mainstream group, the opposition and contradiction between the Yi group and the mainstream group, and the disappearance of the Yi traditional culture (Lin, 2019). Therefore, the study of Yi villagers' acculturation contributes to the stability and unity of the Yi region, the inheritance and the development of Yi traditional culture, and can provide feasible decision-making suggestions for the government and relevant decision-makers.

2. Literature Review

2.1 *The Yi Ethnic*

The Yi ethnic is the sixth-largest ethnic minority in China, with a large population and numerous branches, mainly distributed in the southwest of China. There are independent Yi autonomous prefectures in Sichuan and Yunnan provinces, which are the main areas where Yi people live in compact communities. Due to the historical changes, the Yi branches in these two areas have produced different cultural characteristics and formed two representative Yi factions in China: Sichuan Yi and Yunnan Yi. Sichuan Yi is the most primitive representative. Due to their closed geographical environment, they lived in a closed, autonomous, and slave society before the 1950s, known as the living fossil of the slave age (Liu, 2019). The Yi area in Yunnan began to be under the jurisdiction of the central dynasty more than 600 years ago and came into contact with the mainstream (the Han ethnic). Although it is under the jurisdiction of the Han ethnic, it has always been the implementation of the policy of regional autonomy of the Yi ethnic. Therefore, the characteristics of the Yi ethnic are still quite remarkable. This study will take the villagers of Lipo branch in Yunnan, Nuosu branch in Sichuan, and other branches of the Yi ethnic who live in mixed communities as the research objects and analyze their acculturation and life satisfaction.

2.2 *Acculturation*

Acculturation is a controversial concept, which has different views in the field of sociology and psychology. Sociologists believe that acculturation means that immigrants accept the cultural model of the host country and then gradually abandon the cultural values and customs of their own (Gans, 1997). Psychologists add processes of psychological adjustment, including elements of mental health, such as life satisfaction, stress, or depression (Berry et al., 2006; Ward et al., 2011; Bulut & Gayman, 2020). Berry is a representative scholar in acculturation psychology who proposed a two-dimensional model of acculturation, including four types of acculturation strategies: assimilation, separation, integration, and marginalization. Acculturation strategy can be considered as a pluralistic phenomenon composed of a series of traditional or mainstream cultural ways that individuals can choose. Assimilation is represented when ethnic minority members accept the practices and values of the dominant culture and abandon the traditional culture. The integration will occur when ethnic minority members accept two different cultural value systems simultaneously, and individuals obtain the new society while maintaining the original cultural characteristics. When individuals adhere to the traditional culture and abandon the mainstream culture, it represents separation. Finally, marginalization occurs when individuals are neither loyal to traditional culture nor accept mainstream values (Berry, 1997). Berry's acculturation model discussed individuals' psychological adaptation based on their adherence to the mainstream culture and traditional culture.

A considerable number of studies had shown that Berry's two-dimensional acculturation theory has theoretical guidance and universal applicability for the study of acculturation in China ethnic minorities (Yue et al., 2020; Mao et al., 2018). Therefore, this study assumed that

the acculturation of the Yi villagers has a two-dimensional structure. They maintain their original cultural identity and cultural characteristics and hope to establish and maintain a positive and good relationship with members of the mainstream society. The division of these two different cultural attitudes can be further divided into four different types of acculturations: assimilation, integration, separation, and marginalization.

2.3 Life Satisfaction

Life satisfaction, namely a person's evaluation of his life quality, is a cognitive judgment component of subjective well-being (Diener et al., 1999). Another component of well-being is emotion, both positive and negative. Diener believed that life satisfaction, positive and negative emotions should be assessed separately to understand the overall components of subjective well-being better. In this study, the life satisfaction of the Yi villagers was investigated to confirm the relationship between life satisfaction and acculturation.

Life satisfaction is an important index to measure the degree of acculturation. Good acculturation is predicted by cultural knowledge, exposure, and positive life attitudes (Berry & Hou, 2019; Ryou et al., 2019; Mancini et al., 2018). Individuals satisfied with their lives have a positive attitude towards life and experience more happiness and joy. Previous studies have shown that culture can significantly influence individuals' values and beliefs, thus influencing their evaluation of life quality (Kjell & Diener, 2021). People from individualistic cultures tend to rely on individual emotions to determine how satisfied they are with life. In collectivist cultures, behavior that follows social norms predicts greater life satisfaction (Krys et al., 2019). Hu & Xun (2016) on Chinese Hani adolescents showed that acculturation has a positive effect on life satisfaction. Guinn et al. (2011) found in his study that the acculturation of Mexican-American women did not affect life satisfaction. The differences in the results may be due to differences in the target population.

The Yi villagers in this study mostly live in the poor mountainous areas of southwest China and are in the lower social and economic class. For example, the Sichuan Yi ethnic area is one of the deep poverty areas in China, and it is a national key poverty alleviation area. Poverty often makes culturally disadvantaged minorities face tremendous pressure, which in turn affects their life satisfaction. In addition, the traditional Jiazhi culture (a unique family culture of the Yi) of the Yi is also different from that of other ethnic minorities. The powerful family support system of the Yi ethnic can help individuals cope with external pressure and solve various life problems (Zhang, 2020), thus effectively improving individual life satisfaction. Therefore, this study assumed that identifying with traditional culture helps the Yi villagers gain more family support and enhance personal life satisfaction. Identifying with the mainstream culture helps the Yi villagers solve the problem of poverty and gain more life experience, which has a positive impact on personal life satisfaction.

3. Method

3.1 Subjects

Nuosu came from Sichuan Province in China, while the Lipo came from Yunnan Province in China. The researchers chose Nuosu and Lipo, for both groups mostly live in

Yi area (all living areas are Yi people). In addition, some other Yi branches that lived with the mainstream were randomly selected. A stratified sampling method was used to distinguish the branch, region, gender, and age features. A total of 650 questionnaires were sent out from eight representative Yi villages, and 522 valid questionnaires were recovered. The demographic information of the sample is shown in Table 1.

Table 1: The specific composition of the sample (n=522).

Variable	Statistic	N	%	Variable	Statistic	N	%
Branch	Nuosu	207	39.6	Occupation	Farmer	189	36.2
	Lipo	192	36.8		Self-employed	159	30.5
	Others	123	23.6		Regular worker	98	18.7
Gender	Male	227	43.5	Monthly income	Others	76	14.6
	Female	295	56.5		<1000¥	87	16.7
Age	18-29	125	23.9		1000-2000¥	95	18.2
	30-39	144	27.6	Residential area	2001-3000¥	154	29.5
	40-49	119	22.8		>3000¥	186	35.6
	≥50	134	25.7		Yi area	324	62.1
Education	Primary school	122	23.4	Marital status	Mix area	198	37.9
	Junior school	120	23		Unmarried	109	20.9
	High school	149	28.5		Married	380	72.8
	University	131	25.1		Divorce	33	6.3

3.2 Measurement Scale

Acculturation Scale. Ryder and his colleagues (2000) argued that there was no "absolute best" model of acculturation. The social scientist must choose the most appropriate acculturation model and scale to best match the subject and group of study (Tsai et al., 2000). According to the previous review results, Berry's two-dimensional acculturation model is proved to apply to ethnic minorities in China. The two Acculturation Questionnaire (QAQ) of Han & Berry (2016) was adopted to construct the two Acculturation Questionnaires. According to the actual situation of the Yi people, the ethnic Acculturation problems were adjusted. The project is related to each specific ethnic-cultural group, and finally, the Yi Acculturation Questionnaire is constructed.

The original questionnaire in this study consisted of 23 questions, including two sets, one about the mainstream culture (Han culture) acculturation attitudes, and the other about the original (Yi culture) acculturation attitudes. It was rated on the seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), with 4 being neutral. The original questionnaire was first distributed to 30 Yi people in Panzhihua for initial testing. After the initial test, the distinctiveness test was carried out, and the items with low distinctiveness were deleted.

The final questionnaire has 18 questions, including original acculturation attitudes (11) and mainstream acculturation attitudes (7). The questionnaire has good reliability and validity after testing. The Cronbach's α of original acculturation attitude, mainstream acculturation attitude, and the total questionnaire were 0.903, 0.887, and 0.938. The results of confirmatory

factor analysis and exploratory factor analysis showed that the combined reliability of the two principal components were 0.924 and 0.913, and the extracted mean-variance values were 0.526 and 0.601, respectively. The revised scale had a good fitting degree.

Life Satisfaction Scale. The Life Satisfaction Scale (SWLS) of Diener (1999) was adopted. SWLS measures a person's overall assessment of their life, such as "In many ways, my life is close to what I want it to be." The scale has five items, graded on a seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). SWLS is a widely used measurement method that has been proven to be reliable and effective. The Alpha value of the scale in this study was 0.921.

Demographic Variable. This study will analyze the demographic variables of Yi branch, age, education, gender, living area, marriage, and income, and analyze the impact of these variables on acculturation.

4. Results

4.1 The Acculturation Strategy of Yi Villagers

According to Berry's Acculturation Model, when people face the identification and adaptation of ethnic culture and mainstream culture, there will be two problems: whether they retain their own culture; or whether they are willing to accept and develop their relations with mainstream culture members. Answers to these questions will lead to four modes of acculturation: integration, assimilation, separation, and marginalization (Berry, 1997). In this study, the median value of four was selected as the intermediate point across dimensions. The results (Table 2) showed four acculturation types, which were assimilation type (low value of Yi cultural attitude, high value of mainstream cultural attitude), integration type (double high value of Yi cultural attitude and mainstream cultural attitude), and separation type (high value of Yi cultural attitude, Low value of mainstream cultural attitude) and marginalized (low value of Yi cultural attitude and low value of mainstream cultural attitude). Yi people adopt the *integration* type most, accounting for 75.9%; The second is the *separation* type, accounting for 14.9 %; *assimilation* and *marginalization* were the least, accounting for 5.7% and 3.4%, respectively.

Table 2: Mean and Standard Deviation of Yi Acculturation Strategies and Life Satisfaction

Dimension	Assimilation	Integration	Separation	Marginalization	F
N(%)	30 (5.7%)	396 (75.9%)	78 (14.9%)	18 (3.4%)	
YA	3.38±0.55	5.47±0.75	6.13±0.72	2.97±0.63	166.54***
MA	5.42±0.77	5.33±0.83	3.12±0.61	3.07±0.78	205.78***
LS	5.02±1.27	5.48±1.17	5.28±1.52	3.46±1.28	16.32***

Note. YA, MA and LS in the table represent Yi acculturation attitude, mainstream acculturation attitude and life satisfaction. * represents $p < 0.05$, ** represents $p < 0.01$, *** represents $p < 0.001$, the same as below.

The mean analysis of acculturation strategy and life satisfaction showed that the *integration* strategy's people have the highest satisfaction, followed by the *separation* and the *assimilation*. The satisfaction of *marginalization* is the lowest, which is lower than the median

level. It confirms that integration is the best acculturation strategy and marginalization is the worst.

4.2 Differences in Demographic Variables of Acculturation

Many studies have found that demographic variables will have a significant impact on acculturation. But some literature draws the opposite conclusion. It indicates that the relationship between demographic variables and acculturation has not formed a unified conclusion. In this study, the Chi-square test of SPSS software was used to analyze the two dimensions of Yi villagers' acculturation under different demographic characteristics. The results are shown in Table 3.

Table 3: Analysis of Variance of Acculturation Orientation on Demographic Variables (n=522)

Variable	OAA			MAA		
	Chi-Square	df	sig	Chi-Square	df	sig
Gender	79.952	50	.278	69.331	37	.011
Branch	217.589	100	.000	136.346	74	.004
Age	217.325	150	.514	152.691	111	.008
Education	238.076	150	.000	193.957	111	.000
Living area	134.887	50	.000	79.861	37	.000
Marital Status	124.145	100	.111	81.282	74	.001
Income	234.989	150	.05	239.114	111	.000
Occupation	286.411	200	.000	259.799	148	.000

Note. OAA and MAA in the table represent original acculturation attitude and mainstream acculturation attitude.

Table 4: Analysis of Variance of Acculturation Orientation on Demographic Variables (n=522)

Variable	Item	OAA	MAA	Variable	Item	MAA
Area	Yi area	5.71±0.90	4.66±1.30	Gender	Male	4.78±1.13
	Mixed area	5.10±1.04	5.13±1.02		Female	5.04±1.19
Branch	Nuosu	5.79±0.82	4.77±1.33	Marital	Unmarried	5.18±1.06
	Lipo	5.39±1.00	4.95±1.01	status	Married	4.90±1.16
	Others	4.60±0.96	5.16±1.08		Divorce	4.44±1.42
Work	Farmer	5.60±0.94	4.67±1.17	Monthly	<1000¥	4.30±1.28
	Self-employed	5.31±0.89	4.88±1.18	income	1000-2000¥	5.04±1.16
	Stable job	5.16±1.19	5.37±1.17		2001-3000¥	4.91±1.16
	Others	5.18±1.13	5.15±1.10		>3000¥	5.18±1.03
Education	Primary	5.64±1.03	4.33±1.16	Age	18-29	5.09±0.99
	Junior	5.40±0.94	4.96±1.07		30-39	5.00±1.03
	High	5.30±0.96	5.22±1.10		40-49	4.88±1.31
	University	5.14±1.13	5.12±1.17		≥50	4.73±1.31

Note. OAA and MAA in the table represent original acculturation attitude and mainstream acculturation attitude.

The chi-square test results showed that there were significant differences in the original acculturation attitudes among the Yi branch, education, living area, and occupation ($\text{sig} < 0.05$), while there were no significant differences in the original acculturation attitudes among gender, age, marital status and income ($\text{sig} \geq 0.05$). All population variables in the above statistics were significantly different from the mainstream acculturation attitude ($\text{sig} < 0.05$).

To further analyze the changes between the original acculturation attitude and the mainstream acculturation attitude of the significant variables, the researchers adopted the descriptive analysis method of SPSS to list the mean value and standard deviation of the different significant variables (Table 4).

4.3 Acculturation and Life Satisfaction of Yi Villagers

A regression analysis was conducted on the two cultural attitudes and life satisfaction, and the results (Table 5) showed that the two attitudes of acculturation had a significant positive prediction effect on life satisfaction. The linear regression equation of the model is $\text{Life Satisfaction} = 0.302 \times \text{YA} + 0.27 \times \text{HA} + 1.864$. The determination coefficient is 0.166, indicating that independent variables can explain a 16.6% deviation in acculturation. After correction, the determination coefficient is 0.163, which suggests that the equation's goodness of fit is good. In the model, the influence of the Yi cultural attitude is more significant than the mainstream cultural attitude.

Table 5: Regression Analysis of Yi Villagers' Life Satisfaction ($n=522$)

Independent variable	UC		SC	T	R ²	Adjust R ²	Durbin-Watson B
	B	SE	Beta				
(constant)	1.864	.348		5.355	0.166	0.163	1.593
YA	.378	.050	.302	7.521***			
MA	.298	.044	.270	6.740***			

Note. YA and MA in the table represent Yi acculturation attitude and mainstream acculturation attitude

5. Discussion

5.1 The Overall Acculturation Strategy of Yi Villagers

The statistical results of acculturation based on quantitative analysis show that the acculturation degree of the Yi villagers is generally high, and their acculturation strategies are mainly integrated, followed by separation, and a small part of assimilation and marginalization. The acculturation strategies of most villagers are integrated, which indicates that individuals have integrated two cultures and are the ideal type of acculturation. It is consistent with the results of acculturation studies of other ethnic minorities in China, indicating that mainstream cultural groups in China have a high degree of acceptance and respect for ethnic minority cultures (Guan et al., 2019). This result also confirms that Berry's two-dimensional model of acculturation applies to Yi society. It is found that Yi people do not give up their traditional culture in the process of accepting the mainstream culture, which is a two-dimensional phenomenon. The two-dimensional model

is the most widely used model in current studies on acculturation, which can better explain various characteristics in the process of acculturation of ethnic minorities (Yoo, 2021).

5.2 Dynamic Acculturation Development Trend of Different Yi Branches

The Yi ethnic of different branches have formed a unique cultural form as the unique characteristics of history and regional environment, and its acculturation has also presented a dynamic development trend. The history of their contact with the mainstream society is a dynamic development process from far to near and then to complete contact. Similarly, their acculturation strategies also showed a trend from separation to integration, and then to assimilation and marginalization after complete contact, as follows:

The separation strategy of the Nuosu in Sichuan Province. The separation strategy of Nuosu is significantly higher than that of other branches, which is related to their history and geographical location. The Nuosu people have lived in remote mountainous areas since ancient times, and the traffic is extremely inconvenient. In the past, they were isolated. It was not until the 1950s that they began to accept the unified jurisdiction of the mainstream society, which is known as the "leap of the millennium" from the slave society to the socialist society (Xiao et al., 2018). Therefore, the Nuosu was the most recent to contact the mainstream society and was the representative of the traditional Yi branch. Since ancient times, they have had less contact with the outside world and are less influenced by the mainstream society. They follow the beliefs and customary law rules of the ancient Yi society and highly identify themselves with the traditional culture. When they experience mainstream culture in modern society, many people cannot accept it at the moment due to immense cultural differences. While passively accepting it, they do not recognize the mainstream culture and have a negative attitude against it. They are often not well prepared for culture shock, prone to conflict and contradiction with the mainstream society, and cause various social problems.

The integration strategy of the Lipo from Yunnan province. There are many Yi branches in Yunnan, but due to the common historical background, they have experienced similar historical and cultural changes. Different Yi branches have similar cultural characteristics, and their differences in acculturation are mainly reflected in different living areas (Yi area or mixed area). The Lipo people in this study mostly lived in the pure Yi area. These villagers have a long history of contact with the mainstream, and they have had a deep understanding of the mainstream culture. Meanwhile, due to living in a relatively independent area of the Yi ethnic group, individuals experience less pressure of mainstream culture shock and can also get much support from people of the same ethnic group around them, with higher life satisfaction. They generally identify with their original culture and mainstream cultures, which is the best state of acculturation.

The assimilation and marginalization of other Yi branches in the mixed area. Although the Yi individuals living in the mixed areas have a deep understanding of the mainstream culture, they will feel the impact of the mainstream culture directly because they are living among the mainstream groups. The pressure of acculturation may change their attitude towards different cultures. The Yi individuals who migrated from the Yi area first may have an integrated attitude, but after living in the mixed area, some felt inferior and resistant due to the gap between them and the mainstream group. They could not integrate into the

mainstream group, and there was no intra-ethnic support around them, which quickly led to the marginalization trend. Some people think that they are no different from the mainstream people. They adapt entirely to and identify with the mainstream culture, and their behavioral characteristics are consistent with the mainstream group, forming a trend of assimilation. Individuals in the assimilation state can adapt to the mainstream culture, but abandoning their original culture is likely to cause the loss of traditional culture, and individuals may also face some deep-seated adaptation problems.

5.3 Individual Differences in Acculturation

Previous studies on the relationship between demographic factors and acculturation have not drawn consistent conclusions, and some results even have quite a few contradictions (Cao et al., 2017). Based on the research results of this paper, the impact of demographic factors on acculturation can be summarized as follows:

The gender difference. The acculturation degree of the Yi women is significantly higher than that of men, and this gender difference reflects the uniqueness of Yi's acculturation. In the patriarchal society of the Yi ethnic, the social status of women is generally lower than that of men, especially in the traditional Nuosu. As subordinates of men, women have to undertake more work than men and are placed on the high expectation of reproductive inheritance but do not get the due status. However, the Yi women of lower status have higher acculturation ability, which may be related to the industriousness and optimism of the Yi women. In Yi society, women play a more important role than men, and they are often more industrious than men. There are many myths of Yi people that praise Yi women's diligence, kindness, and bravery. These traditional virtues make them more confident and optimistic than men, so they are more likely to adapt to the changes of modern society.

The age difference. The influence of age on the acculturation of Yi ethnic reflects the commonness of the development of modern society. The results showed that the value of the Yi culture attitude increases with age, whereas the value of the mainstream culture decreases with age. The older Yi villagers tend to be more traditional and conservative in their thinking and less willing to accept new things. Young people in the new generation are full of passion and dare to challenge new things. To improve their living standards, they will take the initiative to contact mainstream groups. Therefore, the acculturation of young people under 30 years old is better than that of middle-aged and older adults over 30 years old.

The difference in educational background. Education is an essential influencing factor in acculturation (Li & Yao, 2019), which is consistent with previous research results. The acculturation of the Yi villagers with a high school education or above is significantly higher than those below. Among them, the acculturation of the primary school group is the worst, and the acculturation of the high school group is the best. The acculturation of college individuals is not as good as that of those with high school education, which may indicate that individuals have more extensive contact with the mainstream society and face more competition and pressure after entering college. It may also show that education received before adulthood can shape the individual's values, while education received after

adulthood has limited influence on the individual and is not enough to change the individual's acculturation attitude.

The difference in occupation and economic income. The Yi villagers mostly live in economically backward mountainous areas, and their family income is mainly based on farming. However, poor land in mountainous areas cannot bring more income, so rural villagers often have low income and live in poverty, which in turn challenges the key objective of the state's poverty alleviation work. In the modern competitive society, poverty will make individuals face more life pressure, become inferior and feel marginalized. Those who can improve their family income through work or doing business are more open-minded and can adapt to social changes more quickly. Therefore, the lower the income, the worse the acculturation of the Yi villagers, among which the agricultural group has the worst adaptability, and the stable working group has the best adaptability.

The difference in marital status. Marriage acculturation difference is one of the cultural characteristics of the Yi ethnic. Yi people follow the traditional concept of marriage. Although it has changed with the development of modern society, most of them still insist on marriage within the ethnic or branch and forbid intermarriage among different ethnic groups or even different branches to ensure the purity of ethnic descent. Such internal marriage rules of the Yi people tend to make their thoughts more conservative, which is not conducive to a larger society. The results showed that the acculturation of the unmarried Yi villagers is significantly higher than that of married individuals, and divorced individuals are the worst acculturation. Therefore, the rules of intermarriage may limit further development of the Yi villagers, and unhappy marriages may easily lead to individual cultural misfits.

5.4 Acculturation Positively Predicts Life Satisfaction

The study shows that the vast majority of the Yi villagers are satisfied with their lives, with those who adopt the integration strategy having the highest satisfaction, followed by those who adopt the separation and assimilation strategy, and those who are marginalized having lower satisfaction than the median level, indicating dissatisfaction with their lives. Life satisfaction is significantly positively correlated with the two cultural attitudes. The positive attitude towards both the original culture and the mainstream culture can promote the improvement of individual life satisfaction. The more the Yi villagers identify with the two cultures, the more positive they will be to face life and adapt to modern society, thus improving their life satisfaction. In fact, acculturation and life satisfaction influence each other. Individuals with high levels of acculturation are more likely to obtain high life satisfaction (Fang, 2020), and in turn, life satisfaction will also have a significant impact on acculturation. Therefore, good acculturation ability can improve life satisfaction of the Yi villagers, and to improve their acculturation is closely linked to their life satisfaction.

6. Suggestions on Improving Acculturation of Yi Villagers

6.1 Adhere the Policy of Regional Autonomy

The research results of the Yi villagers from different branches and regions showed that the acculturation of Lipo villagers living in Yi areas is the best, and the marginalization rate of the Yi villagers living in mixed areas is the highest. It further confirms appropriateness of the

policy of Regional Autonomy. The Yi villagers who have lived in the autonomous region for a long time identify with their ethnic culture and highly identify with the mainstream culture. They are bicultural by integrating themselves into the two cultures and are in the best state of acculturation. Therefore, when faced with different cultural shocks, the vast majority can actively face and cope with cultural conflicts to ensure the stability and unity of ethnic areas. The acculturation practice of China has proved that the policy of Regional Autonomy of ethnic minorities plays a vital role in safeguarding ethnic unity, promoting the development of ethnic areas, and enhancing ethnic cohesion.

6.2 Strengthen Primary Education in Minority Areas

Primary education is generally at the stage of individual growth. The growth stage is the vital period to form individual values. Therefore, primary education can help minority individuals establish correct cultural values and learn to live in harmony with the mainstream group in a multicultural environment. Current education pays more attention to mainstream society, and it is often difficult for students in minority areas to obtain equal educational conditions with mainstream society. Due to remote geographical location, backward economy and rather unstable teaching quality, education conditions in minority areas are much lower than those in the mainstream society. It makes the minority teenagers who are at a cultural disadvantage feel inferior and maintain a solid defensive mentality towards the mainstream culture. Therefore, the government needs to increase support and investment to solve the primary education problems in minority areas. Primary education can serve as a means to enhance the local people's sense of cultural identity, improve the knowledge and ability of cross-cultural adaptation, and fundamentally promote Yi villagers' acculturation.

6.3 Increase Income Sources for Ethnic Minority Villagers

The acculturation of Yi villagers is significantly related to occupation and income. Individuals with agricultural production had the lowest income and the worst cultural adaptability. Farmers have a single source of income, and farmers in ethnic minority areas get less income from crops due to their remote and harsh geographical location. Therefore, the government should support and help farmers in minority areas to increase their income. They can develop e-commerce for agricultural products through the development of ecological leisure agriculture. Farmers can be supported in starting businesses, increasing their income, and establishing agricultural enterprises with the support of government venture capital funds. They can be helped to adjust and optimize the structure of agriculture, develop various forms of appropriately scaled operations, and increase revenue from operations. The existing preferential policies for ethnic minorities should be implemented without delay to improve the living standards of ethnic minorities, narrow the gap between urban and rural areas, and better promote the positive cultural adaptation of ethnic minorities.

6.4 Strengthen the Abolition of Bad Marriage Habits and Advocate Free Marriage

Yi ethnic's customary marriage law is an integral part of Yi ethnic's traditional culture, which is deeply rooted in Yi society and their traditional thoughts. Therefore, in today's advocacy of marriage freedom, the contradiction between the traditional marriage customary law and the national law has not been effectively coordinated. Traditional marriage habits and internal engagement are still prevalent in the Yi area, which hinders the area development and affects the acculturation of individuals. Therefore, the government needs to strengthen the governance of marriage rules, adopt reasonable rules, abandon bad marriage habits, realize the freedom of marriage, and promote the localization of the national marriage law in the Yi area.

7. Conclusions and Limitations

This study explores the acculturation and life satisfaction of the Yi villagers from different branches. So far, there have been no other similar reports on Yi villagers' acculturation. This study showed that the acculturation strategies of the Yi villagers were mainly integrated, different Yi branches have transformed from primitive to modern society, and their acculturation has also experienced a trend from separation to integration, followed by assimilation and marginalization after complete contact. The acculturation of the Yi villagers is in line with Berry's Acculturation Model. The results also showed that acculturation is significantly related to individual gender, age, education, income, and marital status. Both the Yi acculturation and mainstream acculturation attitudes have a significant positive predictive effect on life satisfaction.

The study on the acculturation of the Yi villagers will help the government strengthen social governance in the Yi area and improve their acculturation ability. The researchers noted that the study has some limitations. First, the sample in this study is limited to the adjacent region. The limitation of the sample will affect generalizability of the research results. It is not conclusive that the patterns found in this study can be applied to the Yi villagers in other different regions or individuals in similar cultural contexts. Future work should attempt to obtain samples from other regions with different contexts, such as the Yi people from Guizhou and Guangxi Province to examine the invariance or variability of the research results.

Secondly, most of the data in this study are from cross-section data. The data collected at a time node may deviate from the analysis results. A longitudinal approach could be used in future studies to further examine the causal relationship between related variables.

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ISSN 2730-2601

RICE Journal of Creative Entrepreneurship and Management, Vol.2, No.3, pp. 69-83,
September-December 2021

© 2021 Rajamangala University of Technology Rattanakosin, Thailand

doi: 10.14456/rjcm.2021.36

Received 6.09.21/ Revised 14.09.21/ Accepted 25.09.21

Learning Organization Development: A Case of the Armed Forces Academies Preparatory School

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Abstract

This research examined the development of a military preparatory school under study as a learning organization by the characteristics based on organizational learning. The objectives of the research were (1) to analyze the components of learning organizations (2) to identify the desired and actual conditions of the Armed Forces Academies Preparatory School as a learning organization. The subjects were 320 in total comprising 29 administrators, 55 supervisors and 236 staff members of the School. The research tool was a questionnaire on a scale of 1 low to 5 high regarding the aspects or characteristics of a learning organization at the levels of organization, group and individual. The results from the participants' responses showed the School in the development process into a learning organization at a moderate level in *Actual Condition* (Mean=3.747, S.D.=0.223) in contrast with *Desired Condition* (Mean=4.254, S.D.=0.253).

Keywords: *Learning organization development, learning organization characteristics, desired condition, actual condition, Armed Forces Academies Preparatory School*

1. Background and Rationale of the Study

Santiprabhob (2017) described the present world of uncertainty in three main trends: (1) Globalization—the *growing interdependence* of the world's economies, cultures and populations with flow of information in across-border activities; (2) The leap in the development of technology--known as Big Bang of Technology--according to Moore's law that computer processing improves twice every two years, resulting in more *human dependence on technology* with artificial intelligence (AI); and (3) The big flow of capital, known as *financialization*. In coping with these trends, people need four skills necessary in the modern world for life, study, and work. Building these skills is required of a learning organization to enable employees' rapid and continuous adaptation to new environments and effective mutual learning (Makhasiranon, 2014). Adaptability can be identified as the most important aspect of a learning organization which systematizes, creates, disseminates and consolidates new knowledge for the organization (Dekoulou & Trullas, 2015). In a learning organization, employees' learning does not stand still and they need to acquire new knowledge and update skills for the growth of the organization with flexibility and in dynamics (Saadat & Saadat, 2016). Individuals' knowledge and skills have become a key factor that accounts for success or failure of today's organizations under economic, political and social influences which

constitute a learning environment (Fuller & Unwin, 2010). The knowledge of organizational learning and its environment have been studied by various researchers and academics regarding the concepts and theories of strategic human resource management (Wuthirong, 2016). Research by IBM Corporation in 2012 pointed to human capital as the first factor for sustainable growth of the organization, accounting for 71% of the organization's development factors; and organizations need competent human capital to remain competitive in business operations (Garvin, 1993; Yulk, 2002; Suthmanon, 2017). Dedicated investment in human resources at all levels to learn and value innovation will enable an organization to develop learning as the main component of an organization's culture (Mongkolvanich, 2013), and move toward the world's transitioning phase into the 21st century that is full with new threats and challenges. Maesincee (2018) identified new limitations and new competencies to be developed for Thailand's human capital to catch up with the demands of the 21st century. Production skills specified in the country's strategic plan promotes the use of digital technology by the National Digital Learning Platform (NDLP) system (Dolprasit, 2019). Digital technology helps workers to survive in the modern society effectively with allocated resources for personnel at all levels. This is for them to continue acquiring knowledge and creating innovations to contribute to the growth of their learning organization (Suthmanon, 2017).

2. Research Objectives

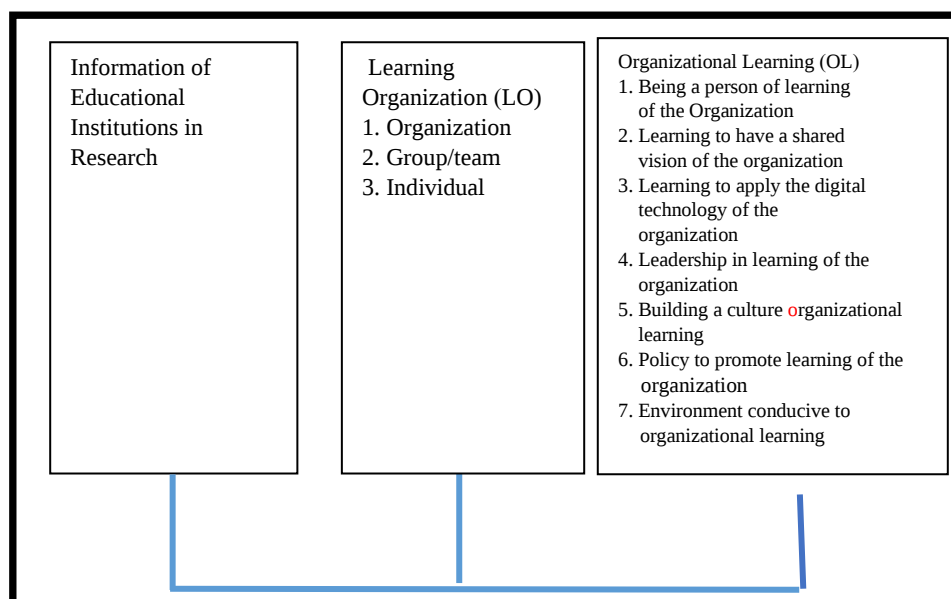
There were two objectives in this research:

- (1) To analyze the components of learning organizations, and
- (2) To identify the desired and actual conditions of the Armed Forces Academies Preparatory School as a learning organization.

3. Research Conceptual Framework

The researcher used three stages in conducting this study: obtaining information from educational institutions, examining the components of the learning organization (LO), and exploring the characteristics of organizational learning (OL), as shown in Figure 1 below.

Figure 1: Research Conceptual Framework



4. Organizations

According to Jones (2001), an organization can serve as a tool that helps individuals coordinate to achieve the needs or goals of individuals in an organization. People in the society use various opportunities to meet their needs by using resources to attain entrepreneurship.

Daft (2010) considered an organization existing in a society to achieve the goals of the organization by making a structured design with coordinated activities. It is connected to the external environment in which people are important elements interacting with each other.

The organization therefore has a structure that contains its process to support different parties to work together for success according to the goals of the organization. Two or more people work together to achieve common goals. The concept of organization is classified in two aspects: (1) a traditional organizational concept on a *non-living organization*, without life or action on its own, and (2) a modern concept on a *living organization*, with the ability to develop and survive on its own. The second concept allows people in the organization to think independently, communicate and exchange information among all parties concerned—all to create a learning organization collaboratively. In addition, support from the human resource unit in the organization can help workers to develop good competencies for its operations to remain successfully competitive with the counterparts (Sukiam & Likitsarun, 2021).

5. Definition of Learning Organization (LO)

Senge (1990) identified the Massachusetts Institute of Technology as an organization that expands the scope of competence to produce the desired effect. When continuously expanding their potential, employees are able to create and work toward the set goals. A variety of new thinking patterns emerge when each one feels inspired and continually learns to work with others for the organization's good performance.

Pedler, Burgoyne, & Boydell (1991) emphasized that organizations facilitate individual learning to create learning atmosphere and encourage everyone to learn together.

Garvin (1993) of Harvard University explained characteristics of an organization in creating creative skills, seeking, and transferring knowledge to reflect that the operator has new knowledge and understanding of things.

Watkins & Marsick (1993) discussed a people-based organization of excellence by creating excellence in people using learning as a continuous strategic process integrated into operations as well as empowerment to stimulate cooperation in team work. It is important to promote open dialogue and connection in interpersonal dependence in communities within organizations.

Marquardt & Reynolds (1994) asserted that an organization should provide individuals with an atmosphere for group learning. People need an analytical thinking process to help understand that everyone is to help the organization from mistakes and successes, and as a result, everyone is aware of change and can adapt themselves effectively.

Marquardt (1996) added a system approach to the learning organization with five subsystems: (1) learning, (2) organization, (3) people in the organization, (4) knowledge, and (5) technology.

Yukl (2002) pointed out that organizations desiring employees to learn things to improve work, share ideas and work knowledge to adapt themselves to the changing environment. Organizations need to allocate resources to invest in personnel at all levels to value learning and innovation as a corporate culture.

Phucharoen (2006) emphasized that an organization needs to encourage employees to develop their ability to create good work for the organization with loyalty. All staff, from top to bottom, and where possible should be supported to deal with customers, suppliers, shareholders, and communities effectively.

Panich (2010) clarified that learning can be facilitated in a dynamic process to establish a corporate culture. The emphasis is on improved performance in terms of quality, efficiency in performance, and innovation as organizational characteristics of the desired corporate culture that involves all employees' collective efforts.

Wetsanarat (2021) signified human resource development in a service-based organization's operations in the area of soft skill competencies especially communication and collaboration skills. These skills are needed to facilitate employees' teamwork and information sharing of new knowledge and innovations, as well as enhance the organization's competitiveness in the long run.

Petchroj (2021a, 2021b) asserted that creativity is required in a higher education institute via learning administration in the digital age. It is important that a learning organization in education pay attention to development of shared information infrastructure and communication skills in its personnel. With such development in focus, the organization can manage resources allocated to staff members for their continued learning of new knowledge and skills for effective communication and collaboration so that all parties concerned can move as a team toward the identified goals.

From the literature, the learning organization requires an atmosphere that encourages learning of personnel. Individual groups in the organization are free to learn, create diverse knowledge together, communicate, share knowledge, and help form a corporate culture. The organization needs to enhance its staff's competency and potential to make good progress in attaining the identified goals. Continued learning for innovation can help sustain the organization to cope well with change into the future.

6. Organizational Learning (OL)

Organizational learning is generally known as a positive knowledge transfer through experience within an organization. Improved organizational knowledge and learning depend on personnel experience in the organization for adaptation through technology, activities, coordination, and good communication. The activities aim at enhancing the organization's ability to acquire and develop new knowledge in a process. Learning could be from both mistakes and the success of the organized activities done to make a goal on learning as a corporate culture. (Rassameethammachot, 2015)

When it comes to a process to make systematic adjustments in an education institution as a learning organization, the operators need to increase the capacity or capability of the academic and support staff to work effectively and efficiently in group or team learning as well as individual learning (Taphun, 2020).

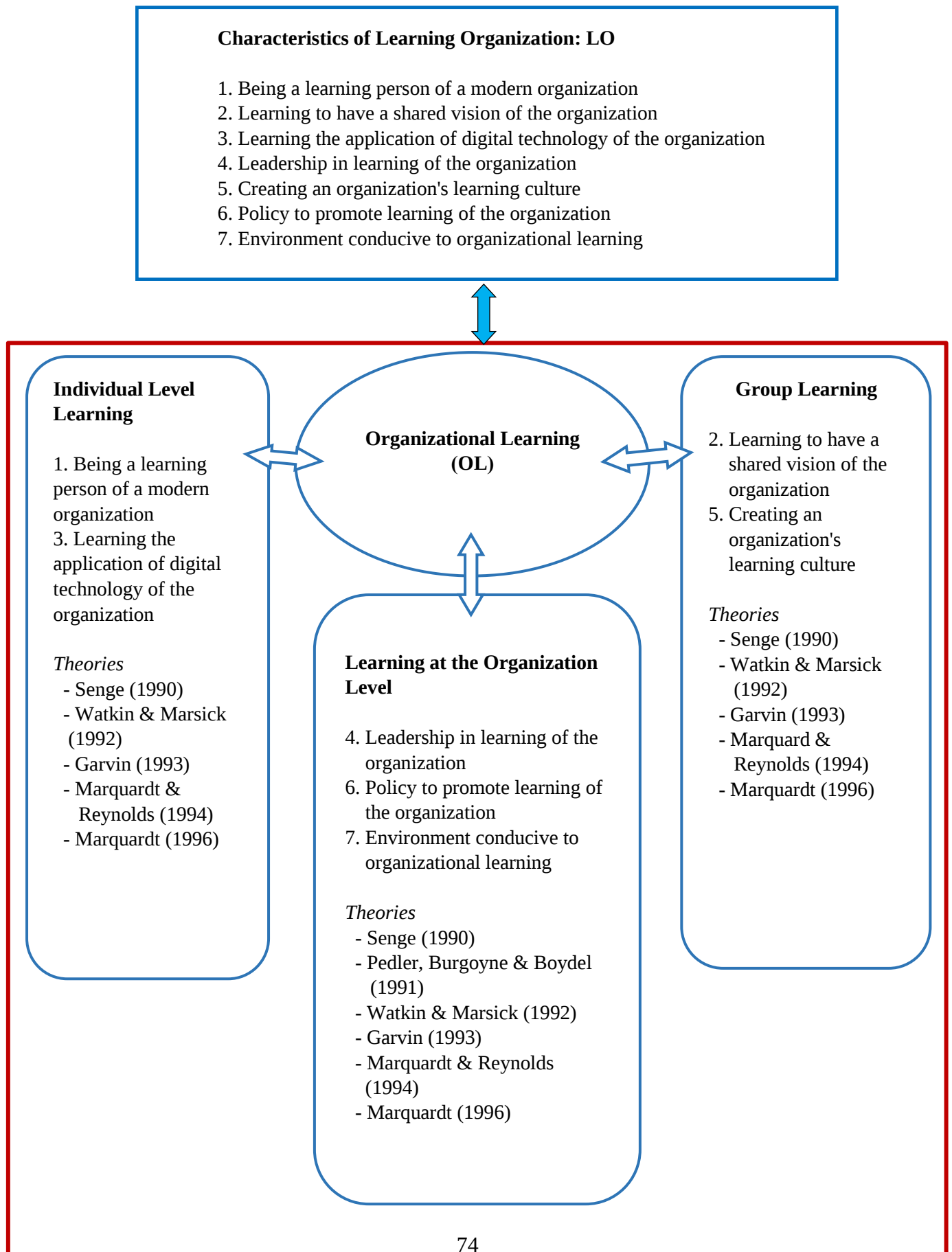
Corporate learning usually involves an organization's process in developing personnel over time to acquire and use gained experience to generate new knowledge transmitted within the organization (Valamis Group <https://www.valamis.com/hub/organizational-learning>, 2021).

Organizational learning as a process therefore focuses on experiential learning and the knowledge gleaned from daily activities. In such a process, employees take on experience and knowledge they collect on their day-to-day activities to deal with various business situations and required tasks (<https://th.strephonsays.com/organizational-learning-and-learning-organization-4310>).

7. Summary of Organizational Learning Methods

From the literature on learning organizations and methods of organizational learning, the researcher summarized the concepts and methods concerned in Figure 2 as shown below.

Figure 2: From a Learning Organization (LO) to Organizational Learning (OL)



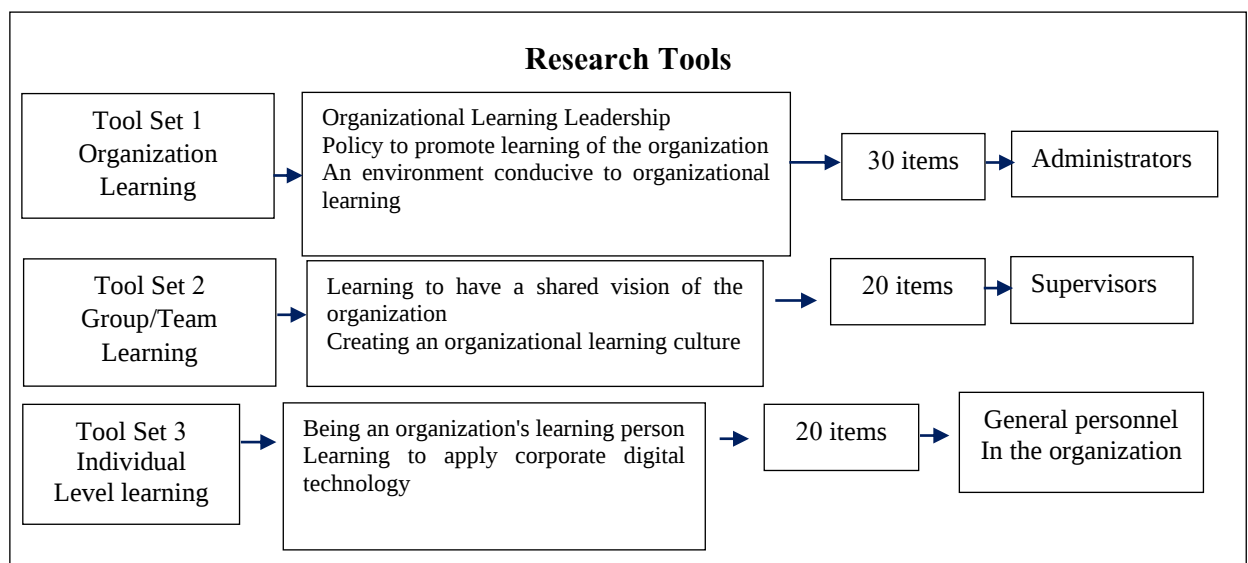
8. Research Methods

The researcher used a quantitative research method to collect data in response to the research objectives.

The participants were 320 of 900 personnel of the Armed Forces Academies Preparatory School in Academic Year 2019, obtained by using the Yamane formula (Cresswell, 2009). The respondents were 29 administrators, 55 supervisors and 236 staff members of the school.

The instrument was a Likert-type scale questionnaire on 1 low to 5 high based on organizational learning concepts in the aspects of levels, as well as desired and actual conditions. The collected data were analyzed by response frequency, percentage, mean, and standard deviation.

Figure 3: Research Tools



8. Results

The results of the research dealt with the participants' perception of the desired and actual conditions of learning organization at three levels--organization, group and individual--in the Armed Forces Academies Preparatory School under study.

Table 1: Information on Learning Levels and Returned Questionnaire

Set	Learning Level in the Armed Forces Academies Preparatory School	Number of Sent Questionnaires	Number of Returned Questionnaires	Percentage
1	Organization	35	29	82.86
2	Group/Team	60	55	91.67
3	Individual	245	236	96.32
Total		340	320	94.12

Table 1 shows the percentage of questionnaires distributed, and overall returned at 94.12%.

As for the desired and actual conditions of the Armed Forces Academies Preparatory School as a learning organization at 3 levels--organization, group and individual, Table 2 reports the results of the data analysis classified by the levels and conditions.

Table 2: Development Levels and Desired and Actual Conditions of Learning Organization at the Armed Forces Academies Preparatory School

Set of Questionnaires	Development Levels of the Armed Forces Academies Preparatory School based on the Concept of Corporate Learning	Desired Condition				Actual Condition			
		$\bar{x}$	(SD)	Meaning		$\bar{x}$	(SD)	Meaning	
1	Organization learning (3 aspects)	4.399	2.082	High		3.894	1.097	Moderate	
2	Group/team learning (2 aspects)	4.382	0.652	High		3.857	0.858	Moderate	
3	Individual learning (2 aspects)	3.953	0.944	Moderate		3.490	0.956	Moderate	
	Total	4.254	0.253	High		3.747	0.223	Moderate	

Table 2 shows the participants' perception toward *the desired condition* of the Armed Forces Academies Preparatory School as a learning organization at the high level ($\bar{x}$ = 4.254, SD = 0.253): Organization level ($\bar{x}$ = 4.399, SD = 2.082) and Group level ($\bar{x}$ = 4.382, SD = 0.652); however, Individual level was only moderate ($\bar{x}$ = 3.953, SD = 0.944). *The actual condition* at the levels of organization, group and individual turned out differently, that is, at a moderate level, as shown in the values of mean and standard deviation (overall $\bar{x}$ = 3.747, SD =0.223).

Table 3: Seven Aspects Classified by Development Levels, Desired and Actual Conditions of Learning Organization at the Armed Forces Academies Preparatory School

Development Levels of The Armed Forces Academies Preparatory School based on the concept of corporate learning	Desired Condition				Actual Condition			
	$\bar{x}$	SD	Meaning		$\bar{x}$	SD	Meaning	
Organizational learning (3 aspects) N=29	4.399	2.082	High		3.894	1.097	Moderate	
Organizational Learning Leadership	4.376	0.762	High		4.038	0.770	High	
Policy to promote learning of the organization	4.466	0.677	High		3.866	0.800	Moderate	
An environment conducive to organizational learning	4.355	0.678	High		3.779	0.736	Moderate	
Total	4.399	2.082	High		3.894	1.097	Moderate	
Group/Team learning (2 sides) N=55	4.382	0.652	High		3.857	0.858	Moderate	
Learning to have a shared vision of the organization	4.256	0.696	High		3.660	0.926	Moderate	
Creating an organizational learning culture	4.507	0.607	High		4.055	0.790	High	
Total	4.382	0.652	High		3.857	0.858	Moderate	
Individual learning (2 aspects) N=236	3.953	0.944	Moderate		3.490	0.956	moderate	
Being an organization's learning person	3.938	0.901	Moderate		3.483	0.913	moderate	
Learning to apply corporate digital technology	3.968	0.987	Moderate		3.497	1.000	moderate	
Total	3.953	0.944	Moderate		3.490	0.956	moderate	

Table 3 contains seven aspects under three levels as perceived by the participants (N=320):

- At the organization level, there were 29 responses to three aspects: (1) Organizational Learning Leadership, (2) Policy to promote learning of the organization, (3) An environment conducive to organizational learning.
- At the group level, there were 55 responses to two aspects: (1) Learning to have a shared vision of the organization, (2) Creating an organizational learning culture.
- At the individual level, there were 236 responses to (1) Being an organization's learning person, (2) Learning to apply corporate digital technology.

It can be seen that the results shown in Table 3 are similar to Table 2, that is, the participants perceived the five aspects of the desired condition for the learning organization at a high level, but two aspects at the individual level at the moderate level ($\bar{x}=4.399$, $SD=2.082$; $\bar{x}=4.382$, $SD=0.652$; and $\bar{x}=3.953$, $SD=0.944$, respectively).

When considering the seven aspects of the actual condition for the learning organization, the participants perceived them at the moderate level ($\bar{x}=3.894$, $SD=1.097$; $\bar{x}=3.857$, $SD=0.858$; $\bar{x}=3.490$, $SD=0.956$, respectively).

From the results at the individual level, it can be seen that the executives and the management team of the Armed Forces Academies Preparatory School need to pay attention to human resource development and take a prompt action on the learning organization development to actualize the desired condition as valued by the participants or the personnel of the School.

9. Discussion and Conclusion

The results of the study showed that the School under study needs to consider the implementation of seven aspects of a learning organization without delay: (1) Organizational Learning Leadership, (2) Policy to promote learning of the organization, (3) An environment conducive to organizational learning, (4) Learning to have a shared vision of the organization, (5) Creating an organizational learning culture, (6) Being an organization's learning person, and (7) Learning to apply corporate digital technology.

The five aspects at the organization and group levels were perceived by the participants as highly desired, but moderate in actualization. The School's administration needs to set up a policy in support of their development and implementation. Both top-down and bottom-up channels of communication should help facilitate desired learning behaviors and corporate culture in acquiring and sharing knowledge via digital technology across all borders within the organization. Leadership from the management can lead the workforce toward the shared vision on the goal of becoming a full-fledged learning organization as part of the education trend in the twenty-first century and beyond (Makhasiranon, 2014; Saadat & Saadat, 2016).

As seen in the results shown in Table 3, the individual level aspect on “Learning to apply corporate digital technology” (Desired condition: $\bar{x}$ = 3.968, SD=0.987; Actual condition: $\bar{x}$ =3.497, SD=1.000) should deserve an immediate action for the reason that digital technology serves a major tool for acquiring and sharing knowledge or information needed for the learning administration of the school (Wuthirong, 2016; Petchroj, 2021a, 2021b).

It should be noted that group or team learning can ease up the process of becoming a learning organization in that group leaders and team members with similar interest can create activities of their preference in support of innovation in the organization. In order to create a learning culture, it is important that staff members can start their shared learning in interest groups so that they can support and collaborate with each other to attain the identified goals of the organization. As known, collective efforts can also help reduce pressure at work and support the staff to overcome obstacles in their work to make good contribution to success of the organization as desired by the management (Garvin, 1993; Suthmanon, 2017).

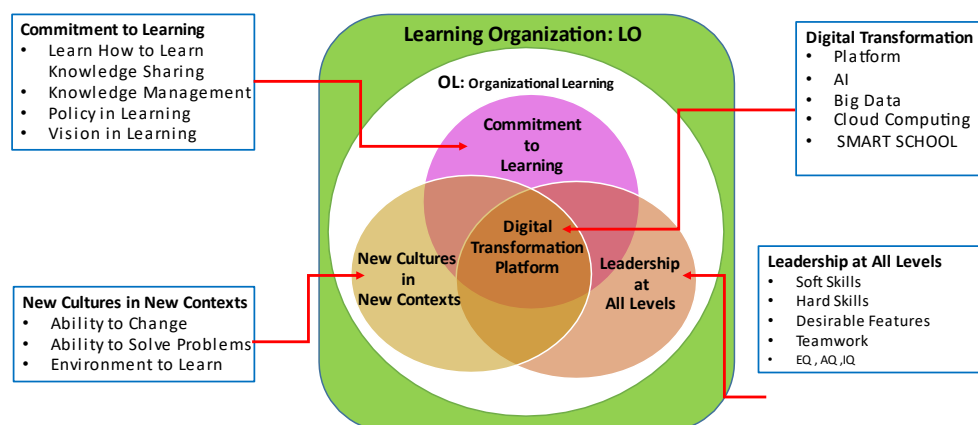
10. Recommendations

Based on the results of the study, the researcher would like to recommend the following for the development of a learning organization:

- (1) Commitment to learning
- (2) New culture in new contexts
- (3) Digital transformation
- (4) Leadership at all levels

These four dimensions with details are shown in Figure 4 below.

Figure 4: Four Dimensions of Learning Organization



Source : Taphun, R., Captain. (2020). Strategy for Development of the Armed Forces Academies Preparatory School Based on the Concept of Organizational Learning. A Dissertation for the Degree of Doctor of Education in Educational Studies Program, Rangsit University, Thailand, p.215.

For an educational institution, the researcher would recommend the use of group and team for the staff to work collaboratively on given tasks by duties or job descriptions. They can help link and coordinate the four dimensions of the learning organization.

- Commitment to Learning

Everyone must have a commitment to learning, seeking knowledge continually, and developing the organization to move toward success. Such commitment can be observed from both personal and organizational behaviors in the ability to learn that how to learn.

- New Cultures in New Contexts

There is a form of a new culture in a new context created by diverse people working together to learn new things and adapt to change, especially when faced with problems. In the changing environment, people's learning has changed to fit in a new context.

- Digital Transformation

One of the most dramatic changes in the organization is its adaptation to the digital age. The organization needs digital technology to communicate within and between organizations, and thus brings in artificial intelligence (AI) to support or even replace humans. Big Data management with cloud technology helps organizations move quickly in real time--for both educational institutions and business organizations for high productivity. Smart schools and smart organizations need digital systems to drive learning.

- Leadership at All Levels

Leadership in learning can lead the organization to progress in developing soft skills or personal skills that enable a person to get along well with others, such as politeness, modesty and socialization. Hard skills mean content, knowledge gained from education combined with other desirable features and the group of three important types of intelligence: Emotion Quotient (EQ) refers to the ability to assess and control one's own emotions; Intelligence Quotient (IQ) refers to the level of intelligence in thinking, reasoning, calculating, and connecting stored information via the innate brain; and Adversity Quotient (AQ) means intelligence in problem solving with flexibility. All these enable a person to adapt well in coping with and overcome obstacles and difficulties on one's own.

These four dimensions of learning organization can serve as a guideline for employees to cope with new cultures in new contexts of the digital age. Organizations certainly need commitment from their personnel to help make a learning culture within by changing the paradigm on how to work and learn in the digital age.

11. The Author

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***Sharing Professional Viewpoint:
Online Learning for Young Learners
during the Covid-19 Lockdown in Bangkok, Thailand***

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1. Introduction

The third wave of Covid-19 in Thailand started from the Thonglor entertainment area of several bars and pubs in the heart of Bangkok at the end of March 2021. Since then, most of the Covid-19 virus-infected cases have been linked to the Thonglor cluster, which rapidly spread around Bangkok, its suburbs, and to other provinces in Thailand (The Bangkok Post, 2021). Consequently, the government announced that all schools/universities and activities, such as gyms, playgrounds, restaurants, and all gathering places be shut down for a few months to curb down the daily infected figures. As a result, schools have turned to online learning systems and applications to support the teachers, students, and parents.

2. Online Learning for Young Learners

Under the Covid-19 conditions, some factors of online learning have impact on young learners particularly at the primary level, regarding the environment and readiness of students in each family. Students do not get to see friends physically, and there is no playground to run around playing tag or catch with friends. The learning time is pretty much on the screen, even though many students might have been used to online classes from the previous lockdowns, which occurred 7-8 months ago. It should be noted that students still need support from parents and the right environment to go on with the virtual teaching mode for quality learning time.

Questions arise:

- What about children who have both parents that work full time or children with a single parent?
- What about children who do not have a proper device, iPad, or computer?
- When the Internet is down, most of the students have no clue about how to deal with IT problems, and what if the student does not have parents who know enough about IT or know how to prepare the student for how to fix the common problems that might arise during their online learning?

Parents are undoubtedly a crucial factor for primary students to deal with online classes. At a young age of 6-11 years old, they tend to be under stress out of not being able to go out as usual, just like us adults. The students might exhibit some anxiety, emotional difficulties, or behaviors out of the ways that they have been, and some parents' responses might not be right or best at the learning time. When this happens, then it could lead to a higher degree of stress or a cycle of more and repeated negative behaviors. An important point to consider is that the Covid-19 “new normal” is a challenge to everyone in the world, no one likes it, but we all have to manage to go through it (Australian Explorer, 2021).

3. Positive support from Parents to Lower Primary Students

According to Damour (2020), to connect the support from parents to students, the first thing that parents can do is to normalize the fact that young learners are feeling anxious. Some parents misunderstand that anxiety is negative and potentially a sign of mental disorder. Psychologists have long recognized that anxiety is a normal and healthy function that alerts us to threats and helps us take measures to protect ourselves. So, it is beneficial for children if parents say, "You have the right reaction. Some anxiety right now makes sense. You are supposed to feel that way. And that anxiety is going to help you make the decisions that you need to be making right now." For example, practicing physical distancing, washing your hands often, and not touching your face are beneficial reactions to the anxiety in coping with Covid-19. These points are related to the author's viewpoint in that if parents are calm and can positively communicate with their children while looking at their children's new emotions or new actions as challenges for them to grow and learn. Then it becomes an opportunity for the children to move in the right direction together during this difficult time for both parents and children all alike, and it could be a win-win situation. In other words, much of turning the challenge into an opportunity is all about the mindset of the parents.

Other than that, researchers have found that finding positive distractions can help us deal with the lockdown. We can watch our favorite movies. We get in bed with a good novel. That is a very appropriate strategy. There's probably a lot of *talking about* coronavirus and anxiety as a way to seek relief, as well as about *not talking about* it as a way to seek relief. Helping children find that right balance will make a big difference (UNICEF, 2020; Peñarrubia-Lozano et al., 2021).

4. Right Teachers

All teachers should be well trained for online learning, particularly for very young students. There are factors that teachers need to be well aware of and know well on how to communicate with students during teaching via the screen. Some parents prefer to sit right next to students, and some teachers might feel uncomfortable about it. Hence, teachers need to perform professionally. Some students' parents are even listening, watching, and checking if the teachers are doing a good job. Some little actions from the teachers might make big misunderstandings between the students and the teachers; and the latter in their teaching role have to deal with many students or some parents during the session. It is important for teachers to pay extra attention to their verbal communication and facial expressions. They can mean a lot to the students as they are still young, need attention, and are very sensitive to negative feedback, if any, during these difficult times. Teachers should be especially mindful to keep a positive and patient voice with a kind face when interacting with students. This is certainly difficult when the teachers may be parents themselves, and face the same challenges as the parents of their children in similar online learning conditions.

5. Final Viewpoint

It is undeniable that most schools try to keep their curriculum content the same--be it in the face-to-face or online classes. However, teachers need to adjust the way they deliver the full content by taking learners' attention span into careful consideration. The planned activities in each lesson require a breakdown into a series of shorter or smaller learning tasks. Teachers have to alternate between the intensity of explanation and interaction with students to reduce hypnotic effects of looking on the screen for long. Especially for Arts and Crafts and PE (Physical Education), students need to do assigned work while recording videos for submission at the end of or after class. Young learners will

need a third party to help with recording and subsequent submission. Or teachers may skip the process or the recording to allow students to focus more on the activity outcomes and knowledge to be gained.

If possible, teachers could try out their designed lesson plans in the time limit specified to students to check practicality of the task to be completed in class or after class. The number of after class assignments or the amount of homework could be less for students to work with assistance from parents, as needed. As known, schools in Thailand tend to pour down homework over both students' and parents' effort and time. These points are for teachers to consider when planning lessons, in-class activities and relevant homework. Furthermore, the school should adjust its assessment system for online learning during the Covid-19 outbreak. It seems unrealistic to use numerous written tests like they once did in the face-to-face classes. Authentic assessment of the target learning outcome per lesson could serve as a more practical and relevant solution for learning achievements via the online teaching and learning mode. What is also vitally important has its focus on teachers' efforts in providing sufficient interaction and securing feedback from students regarding how they feel and react to the online teaching methods used by individual teachers. All these considerations will enable teachers to adjust their teaching and planned learning activities in the timeframe of scheduled online classes.

6. The Author

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Books

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Wallace, M. & Wray, A. (2016). *Critical Reading and Writing for Postgraduates*. Third edition. Thousand Oaks, California: Sage Publications Inc.

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Author.//(Year of publication).//Article Title.//Editor(s) (if any).// *Title of book*.//Edition (if any).//Place of publication:// Publisher,/Page Numbers.

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Hickman, G.R. (2010). Concepts of leadership in organizational change. In Preedy, M., Bennett, N. & Wise, C. (Eds). (2012). *Educational Leadership: Context, Strategy and Collaboration*. Thousand Oaks, CA: SAGE Publications Inc., 67-82.

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Trongratsameethong, A. & Woodtikarn, P. (2019). Thai QBE for Ad Hoc Query. *Journal of Technology and Innovation in Tertiary Education*, 2019, 2(2), 1-24. doi 10.14456/jti.2019.7

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Author.//(Year of publication).//Title of Letter (letter).//*Journal Title, Year (Volume if any),*/Page number.

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Author.//Title.//(Online).//the full address of the web page, accessed date.

Example:

Charlotte, B. Quotes about Action Learning. (Online).
<http://www.goodreads.com/quotes/tag/action-learning>, January 18, 2017.

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