

Do Plant-Based Food Products Communicate Sustainability? A Case Study of Brand Meanings in Thailand and Their Relationship to Sustainable Diets

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Abstract

Meat consumption is a significant contributor to global warming and reducing meat consumption is a key step towards achieving the UN's sustainable development goals (SDGs), and especially to promoting healthier diets, more responsible consumption, and mitigating climate change (SDGs 3, 12 and 13). Although many people broadly understand the impact of diet on sustainability, encouraging changes to eating habits is difficult with many barriers to uptake among most people. There is evidence that nudging people using visual and verbal cues is an effective way to encourage sustainable eating. With the objective of understanding how sustainability is (and is not) being communicated, this paper reviews the visual and verbal messaging of different brands of plant-based foods in Thailand. The findings suggest that sustainability can be leveraged more systematically and consistently, in conjunction with other key category messages, to encourage sustainable eating. Although other research determines that there are multiple motivations for consuming plant-based foods, these findings suggest some approaches to communicating sustainability that might increase the attractiveness of the category to more people.

Keywords: Sustainability, Plant-based foods, Eco-labelling, Communication, Semiotics

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Introduction

Sustainability and meat consumption

Recent reports reflect the growing urgency of taking urgent action to reduce greenhouse gas (GHG) emissions to prevent further global warming and the consequences it brings (IPCC, 2022). The global food system contributes approximately one quarter of GHGs (Ritchie, Reay & Higgins, 2018) with the implication that changes in human diets may be an important step towards slowing down global warming as well as having a positive impact on public health and responsible consumption, consistent with UN Sustainable Development Goals 3, 12 and 13 (Springmann, M. et al., 2018; Willett et al., 2019).

Multiple studies conclude that plant-based diets have smaller environmental impacts. Meat-based diets produce more GHGs and use more water, energy, fertilizer, and land than flexitarian, vegetarian or vegan diets (Chai et al., 2019; González-García et al., 2018; Scarborough et al., 2014; Stehfest et al., 2009), although that does not mean that all vegans have less environmental impact than all meat eaters (Rosi et al., 2017).

Moving to more sustainable dietary habits

This raises the question, “How do we get people to transition from meat-based to plant-based food products?” Studies show that people are reluctant to make this transition, do not respond to educational information (Bianchi, Dorsel, Garnett, Aveyard & Jebb, 2018), and can react negatively to messages to reduce meat consumption (de Boer, Schösler & Boersema, 2013).

However, there is strong evidence that public attitudes are shifting and that increasing numbers of people are open to limiting or reducing their meat consumption (Marketbuzz, 2022; Mintel, 2022; Rakuten, 2022). A 2021 survey by PwC estimated that 51% of consumers across 22 countries are eating more plant-based foods and this number was 80% for Thailand (PWC, 2021).

Identifying your diet

Although a very small minority of people identify themselves as vegetarian or vegan, their numbers are increasing. According to Mintel’s study across 16 countries, only 1% of people are vegan and 3% vegetarian (Mintel, 2022). Marketbuzz found higher numbers of vegetarians and vegans in Thailand at 6% and 14% (Marketbuzz, 2022).

Significantly more people see themselves as flexitarian and the majority as omnivore or carnivore (Marketbuzz, 2022; Mintel, 2022). Academic studies have shown that intervening to reduce meat consumption is more effective than trying to eliminate it and that labelling food as vegetarian, vegan or healthy can be counterproductive (de Boer et al., 2013; de Boer, Schösler & Aiking, 2014; Sparkman & Walton, 2017a).

Closing the “say-do” gap

People’s intentions are not currently translating into day-to-day behaviours. In the language of behavioural science, there is a “say-do” gap between stated intentions

and actual behaviours (Christiano & Neymand, 2017; Mintel, 2022; Sheehan & Webb, 2016).

The literature on nudging (Ensaff, 2021; Thaler & Sunstein, 2021) has tested many interventions that can potentially help close this gap. For example, descriptive social norms, dynamic social norms, and defaults have all been shown to impact sustainable consumption behaviours (Blackford, 2021; De-loyde, Pilling, Thornton, Spencer & Maynard, 2022; Sparkman & Walton, 2017a, 2017b).

Triggers and barriers of sustainable eating

The evidence is that there are more mundane and fundamental drivers of sustainable eating such as visual priming (e.g., eco-labels) and attractiveness and taste of food (Blackford, 2021; Bradford, Hancox & Bryant, 2022; De-loyde et al., 2022; Starke, Willemsen & Trattner, 2021; Turnwald, Boles & Crum, 2017; Turnwald et al., 2019).

This is consistent with market research surveys that find that taste is the most important barrier to sustainable eating, along with cost, in Thailand and across Asia as well as USA and UK (Marketbuzz, 2022; Rakuten, 2022). The same surveys also show that health and ‘following trends’ are the biggest triggers of consumption followed by taste (Marketbuzz, 2022; Rakuten, 2022).

Visual Communication and Messaging of Sustainability

Eco-labelling and visual communication

De-loyde et al. (2022) found that eco-labels are sometimes more effective than other forms of nudging (Ensaff, 2021; Thaler & Sunstein, 2021) to promote sustainable eating. While providing on-pack information has been shown to be less effective on its own (Bianchi et al., 2021), visual approaches can be more effective, from simple eco-labelling schemes to combining explicit and implicit visual cues in the branding and packaging of products, including colours, names, visual symbols and icons, and format and style of the packaging itself (Granato, Fischer & van Trijp, 2022; Robertson, 2019).

While the plant-based foods category is expanding rapidly in Thailand (Bangkok Post, 2022a; Marketbuzz, 2022), there is no agreed standard for communicating sustainability credentials through packaging, labelling and advertising of products. In this paper, the use of visual and verbal communication codes in plant-based foods is investigated across a large number of products available in retail outlets in Bangkok to build understanding of when and how sustainability is being communicated.

Semiotics and communication

Meanings and messages can be communicated explicitly and implicitly on packaging and also in advertising and communications in physical and digital media, for example in, TV advertising, in-store signage, billboards, online advertising, social media pages, company websites, and e-commerce pages (Gains, 2014; Robertson, 2019; Williamson, 1978).

Semiotics is a social science discipline that has been used to analyse such communications (Lawes, 2002). The Cambridge Dictionary defines semiotics as "the study of signs and symbols, what they mean, and how they are used" (Cambridge Dictionary, 2022). Semiotics has been applied to understand and interpret communication across a wide range of applications from humour to Thai politics to science (Arning, 2021; Gains, 2014; Jones, 2014; Lawes, 2018).

Semiotics and sustainability

Semiotics and the parallel discipline of discourse analysis have been applied to many sustainability topics, including the iconography of polar bears (Born, 2019), green advertising (Cox, 2008; Peverini, 2014), corporate social responsibility and NGOs (Catellani, 2011, 2015; Yekini, Omoteso & Adegbite, 2021), and the visual communication of environmental values (Hansen & Machin, 2008, 2013).

The key question addressed in this paper is what are the meanings that are communicated to potential customers about the plant-based foods category in Thailand and to what extent are those marketing messages consistent with different aspects of sustainability? The paper will review a wide range of symbols and signs, including visual and verbal messaging on-pack, in-store, and through digital and broadcast media, although the main focus will be the most immediate explicit and implicit visual communication on packaging at point-of-sale.

Methods

Study materials and data

The fieldwork for this research was conducted between January and July 2022 in Bangkok. During the fieldwork period there was a continuous expansion of the category, with regular new product launches. A total of 112 items were analysed, representing 30 brands.

The items focus on plant-based meals and menu items, but also include two restaurants and two alternatives to dairy products (see Table 1). Data were collected on the packaging, in-store communication, TV and online advertising, company websites, social media pages and e-commerce websites (where available).

Analysis approach

Each item was analysed for the presence of overall thematic themes as well as specific mentions of key terms, words and phrases, and visual cues (for example, does the brand use a specific colour, talk about the topic of health and nutrition, use the term 'vegan', etc). This was conducted item by item (some brands were not always consistent across different items) and a summary table was created in a master spreadsheet.

The summary tables and figures referenced below are based on the number or percentage of items that fit each category. The authors also identified the dominant meaning of each item based on the overall use of different themes and their likely impact at point-of-sale. That is, what is the key message take-out for potential customers? The discussion section focuses on the key themes and how they blend together in example products.

Key Findings

Summary of key themes

Overall, there were a number of common themes and meanings being communicated by plant-based products, with the most common being ‘plant-based’ itself (see Figure 1). The next most common messages are ‘tasty’, ‘healthy’, and ‘vegan’. ‘Sustainable’ is fifth in the frequency of messaging themes that are used in the category.

Other themes that are present are ‘vegetarian’, ‘meat-free’, ‘purity’ (as in free of additives or preservatives, clean, etc), ‘protein’, ‘natural’ and ‘quality’. It is notable that ‘vegan’ is a more common message than ‘vegetarian’ or ‘meat-free’ and also that ‘plant-based’ and ‘healthy’ are among the most frequent messages.

Brand names

The majority of brand names are in English and written with Latin characters, although more than half are made in Thailand. A small number are transliterations of words in Thai or other languages, but very few are translated into Thai (although product variants and descriptions are more likely to be in Thai as well as English). This may reflect the current target audience of this category and also the importance of the category for Thailand’s exports (Bangkok Post, 2022b). It also has the effect of making it more difficult for Thai consumers to understand key messages.

Although ‘plant-based’ is a common overall message, the use of the word plant is less common in brand names although very common in the description of individual items. Only three of the brands use the word ‘plant’ in their names: Absolute Plant, Let’s Plant Meat, and Plant Ever. All three brands are a focus of the discussion section.

The word ‘meat’ is used in 11 of the 30 brands and is clearly an important marker for the category: Beyond Meat, Let’s Plant Meat, Meat Avatar, Meat Zero, Meatly, Meatto, More Meat, Never Meat, NoMeat, OMG Meat, and Omnimeat. The use of the word ‘meat’ in these names covers a range of meanings from ‘this is not meat’ to ‘this is superior to meat’. This reflects a focus of the category on alternatives to meat rather than a neutral and new source of protein and an implicit understanding that meat is bad for health and the environment.

Other brand names are more diverse, although there are some common themes. Many of the brand names invoke the sense of plant-based food, including Bird’s Eye Green Cuisine, Broccoli Revolution, Harvest Gourmet, and V Farm. Two brand names invoke the senses: Krop (see the discussion section) and So Good.

Other brand names are derived from Sanskrit and Thai, including Mantra (‘sacred message’), Pranaa (‘life force’) and MJ (Mudjai or "หมดใจ" ; ‘with all my heart’). The remaining brand names are a mixture of meanings, referencing health (Healthiful), company founders (Fry’s, Linda McCartney’s), excellence (Alpha, First Pride), and astronomical bodies, a town in Leicestershire, UK, and the founders home country (Morning Star Farms, Quorn, Swees).

Packaging colours

Each item was coded for the key colours present and the most common colour was green (see Figure 2). Other important colours were ‘earthy’ in tone (brown was the third most common colour and yellow was fifth). White was the second most frequent colour and transparent the fourth, reflecting that many products used transparent packaging to make the contents of the packaging more visible and reinforcing the similarity with original meat products.

Green, white and brown had much higher frequency than any other colours and green was used by almost three-quarters of the items studied making it a very important colour scheme. While this may be unsurprising for this category, the focus on green shows that its association with sustainability, naturalness and health are important for plant-based products and are important cues for consumers.

Imagery and icons

The products consistently used imagery of cooked food (with meat-like product as the main ingredient) as the most prominent visual on the front-side of packaging, unsurprisingly for a food category. In addition, many items also used transparent packaging to show the contents inside the packaging (e.g., Beyond Meat, Mantra, MJ, More Meat).

Apart from labels (see next section), the most common icon was the use of leaves to connote nature, either as part of the front-of-pack food imagery (e.g., Absolute Plant, Healthiful, Meat Zero), stylised cartoon or drawing in the background on front-of-pack (e.g., Harvest Gourmet, Plant Ever, So Good), or most often embedded into the brand name or logo (e.g., Absolute Plant, First Pride, Healthiful, Krop, NoMeat, OMG Meat).

Some brands use other icons. Both Beyond Meat and Meat Avatar use the outline or shadow of the relevant animal in green, while the Meatoo has an icon as part of its brand logo where the left-half is an animal and the right-half is a plant (in brown and green as is the brand name). Let’s Plant Meat use a range of icons of gardening tools to connote the natural and home-grown nature of the product.

Finally, Absolute Plant is unique in using a ‘superhero’ character on the front of their packaging who is holding and protecting an animal, in line with their brand story of the consumer as hero.

So Good is the only brand to have a full picture of nature (in this case agricultural fields) on the front of the packaging. Although nature is not directly and explicitly referenced apart from So Good, green colour is a strong visual element of many items as discussed in the previous section.

Labelling and quality marks

Labelling and quality marks are frequently used on packaging to communicate health and nutritional messages. Firstly, they are used to endorse the suitability of the product for particular lifestyles and dietary requirements.

For example, vegan products are identified with a quality marks and endorsements: ‘100% vegan’ (Fry’s, Krop), ‘vegan approved’ (Linda McCartney’s), ‘suitable for vegans’ (NoMeat), ‘vegan friendly’ (Never Meat, OMG Meat), ‘certified vegan by vegan.org’ (Omnimeat), or simply ‘vegan’ (Healthiful, Let’s Plant Meat). ‘Vegetarian’ endorsements are slightly less common but are usually in the form of a simpler label. Flexitarian products use a similar simple label, although there are only two brands that use this identity (Meat Zero, Plant Ever).

There are some other unique quality marks and endorsements among the 112 products. Quorn is ‘recommended by netmums’ (a UK parenting community), Beyond Meat is ‘Non GMO Project verified’, and So Good has a ‘HealthStar’ rating. Only two brands are labelled as organic (Broccoli Revolution, Swees).

Apart from these examples, labels are used to convey nutritional information in three ways: what is present in the product (positives), what is absent in the product (negatives), and what amount of an ingredient or component is in the product (numbers). Positives include ‘buddhist friendly’, calcium, fiber, halal, iron, plant-based, and ‘veggie’. Negatives include antibiotics, cholesterol, ‘cruelty’, dairy, fat, gluten, GMO, lactose, meat, MSG, preservatives, soy, and trans fat. Numbers include calcium, calories, energy, fat, fiber, omega 3, protein, salt, saturated fat, and sugar.

Other touchpoints and messages

There are two other touchpoints used to convey a sustainability message. While most packaging uses combinations of cardboard and plastic, very few brands make any claims about recycled or recyclable packaging with Meat Zero the most prominently displayed although still on the back of the packaging while other brands have a small symbol also on the back of the packaging (Beyond Meat, First Pride, Meat Zero, More Meat, V Farm). Beyond Meat also uses the visual appearance of the packaging of some of their products to imply a recycled and more sustainable approach as discussed in the next section.

There is one other notable touchpoint which is sound, or rather implied sound, in the name of Krop which is also discussed below.

Discussion

Dominant themes

The findings show that most items are communicating multiple meanings to consumers. Sustainability is a common theme, although not the most common. The authors looked at the different communication themes for each item in order to identify the dominant meaning communicated, focusing on the most visible touchpoints of packaging and TV advertising where it was used, although all touchpoints were considered. We wanted to determine what are the most important associations when consumers are at the point-of-purchase.

Figure 3 is a summary of the findings. ‘Tasty’ is the most common overall theme, associated with 36.6% of the items reviewed. Tasty is followed by ‘plant-based’ which is associated with 28.6% of items, and then ‘healthy’ (18.8%), ‘meat-free’ (9.8%) and ‘sustainable’ (6.2%). No other dominant themes were identified.

The discussion below focuses on each of these themes and provides examples of how these messages are communicated focusing on example brands for each theme, before a more general discussion of the findings and their implications for communicating sustainability in this category.

Tasty

Tasty is a common theme, reflecting the importance of taste in the category as well as the importance of communicating that plant-based products can be as tasty as their original meat versions.

The brand Krop focuses on communicating taste (Figure 4). Firstly, consider the name itself, which is an English transliteration of the Thai word for crisp or crunchy which invokes the sound of eating (กรอบ; pronounced in Thai with a first letter between a ‘g’ and a ‘k’). The key visual on each pack is one of cooked food presented in a very visually attractive way.

While Krop also communicates health (labels and quality marks), plant-based (item names, ‘eat veg, less meat’, ‘vegan’ or ‘vegetarian friendly’ stamp depending on the item), and sustainability (the presentation of the food and serving utensils in the main picture), the key message is taste.

First Pride is another brand that focuses on taste (Figure 5), demonstrated by on-pack imagery and messaging in their TV advertising on their YouTube channel (First Pride, 2022), focusing on taste as well as health and the production technology. The tagline ‘so irresistibly tasty you won’t believe it’s made from plants’ is used in their communications and the naming of individual product items uses vivid sensory descriptors (e.g., ‘crunchy’, ‘bites’, ‘spicy’). First Pride has a range of locally inspired variants that focus on ‘Thai taste’ and this is clearly the focus of the brand.

Plant-based

Let’s Plant Meat is most focused on communicating that it is a plant-based product (Figure 6). This starts with the brand name and also individual product item names (e.g., ‘plant-based meat katsu’, ‘plant-based larb meatballs’, etc). The pack design uses icons of various garden tools to reinforce the feeling of something that is home-grown. There are some additional labels and quality marks with health and nutrition messages and each variant is prominently identified as ‘vegan’. The brand’s YouTube channel focuses on explaining what plant-based meat is along with the story of the brand (Let’s Plant Meat, 2022)..

Plant Ever is also focused on the theme of plant-based (Figure 7), with its brand name and individual item names (e.g., ‘plant-based nuggets’, ‘plant-based meatballs’, etc). The packaging design uses green colours and leaves prominently. The labelling also talks about health and nutrition including protein and uses the descriptor ‘flexitarian’ and also notice the smiling face hidden in the brand logo! However, the main focus is on plants.

Healthy

OMG Meat is most focused on health (Figure 8) with several prominent nutritional messages on pack, including ‘good source of protein’ or ‘high protein’ (depending on the item), ‘0 mg cholesterol’, ‘no preservative’ and ‘vegan friendly’. The brand’s advertising on YouTube is focused on physical fitness and health (OMG Meat, 2022) and the brand’s website shows many physically fit people in the natural outdoors.

Healthiful is also focused on health, with several prominent nutritional and ingredient messages on pack, including ‘soy free’, ‘gluten free’, ‘no preservatives’, ‘no MSG added’ and ‘vegan and plant-based’ (Figure 9). The packaging further emphasises the ingredients (‘mushroom & jackfruit based’), as does the brand name. Healthiful has its own retail outlets which are called ‘health and wellness stores’, decorated with health images and messages and selling a wide range of health and wellness products in addition to the Healthiful brand itself.

Meat-free

Meat Zero is focused on the absence of meat (Figure 10), most notably in its name, and also in the icon of zero in shades of green and yellow that is part of the brand logo but in larger size is a dominant feature at the front of its packaging and in its TV and online advertising (Meat Zero, 2022). Arguably the zero figure is also implicitly a reference to recycling. Meat Zero uses ‘plant-based’ as a descriptor on many items and also notably has ‘flexitarian’ and ‘vegetarian’ labels on all items and a ‘vegan’ label on most.

NoMeat is also focused on the absence of meat (Figure 11), again through its name and the naming of the product item (‘No Bull Mushroom Steak’). While NoMeat uses the labels ‘plant-based’ and ‘suitable for vegans’ on pack, the brand name dominates first impressions.

Sustainable

Beyond Meat is one of two brands focused on a sustainability message (Figure 12), especially on its website and in its YouTube channel (Beyond Meat, 2022). The videos on this channel are the best example of brand storytelling among the products reviewed, with a consistent message for people to “Go Beyond” which talks about sustainability as a social movement, as well as discussing taste and health, with recipes and cooking tips and multiple celebrity endorsements. Beyond Meat is definitely the most actively promoted brand reviewed for this study.

Although there are several health and nutritional messages on pack (‘non GMO’, ‘no soy’, ‘no gluten’, ‘35% less fat’), the overall impression of the packaging is one of sustainability with a look of recycled cardboard, transparent packaging to see the contents, and the icon of an animal in white on a green background in the top corner of the pack.

The Beyond Meat website is also quite heavily focused on sustainability, with their mission statement. “We believe there’s a better way to feed our future. By shifting from animal to plant-based meat, we can positively affect the planet, the environment,

the climate and even ourselves”. The website also highlights a peer-reviewed life cycle analysis and impact assessment.

Absolute Plant is also focused on sustainability and trying to tell a story about the brand but in a very different way (Figure 13). The brand uses a ‘superhero’ icon as the dominant feature of each pack, holding a relevant animal as a protector of the planet and with the catchline “You’re the next hero to save the world”.

Absolute Plant’s YouTube channel also features the superhero character prominently with the hashtag #youarethenextABhero, although it currently has only 71 subscribers, compared with from 200-17,000 for the other YouTube channels referenced. The pack has some nutritional messaging (‘plant-based’, ‘protein’, ‘fiber’, ‘0 cholesterol’, ‘no preservatives’) and incorporates a smile into the leaf which is part of the brand logo. However, it is the hero image that dominates.

What does sustainability mean for the category?

Based on this analysis, and the relative importance of the different themes, it seems that the main focus of sustainability messaging for plant-based foods is the promotion of healthy diets (SDG 3), with little attention paid to responsible consumption (SDG 12) and climate action (SDG 13) with the exceptions of Beyond Meat and Absolute Plant brands as discussed above.

Some brands mention a few other aspects of sustainability but relatively infrequently. For example, Meat Zero is the most prominent brand to claim that its packaging is eco-friendly and “100% fully recyclable” and there are occasional references from other products to simplicity, organic, balance, and freshness. None talk about the other 14 SDGs.

What about nature?

It is surprising that there is so little reference to nature among the products analysed, with fewer than 40% of items using the word ‘natural’ (or related terms, and only So Good using visuals on pack and OMG Meat relatively prominently on their website. There is strong evidence that connectedness to nature is associated with pro-environmental behaviours (Barragan-Jason, de Mazancourt, Parmesan, Singer & Loreau, 2022; Mackay & Schmitt, 2019). Communicating messages related to nature may be an effective way to target the choices of some consumers. However, these findings suggest that there has been little effort to communicate nature beyond the use of green colour and leaves.

Focus on taste or health?

Taste and health are key themes of communication in the category and this is aligned with consumers’ stated drivers of consumption (Marketbuzz, 2022; Rakuten, 2022). However, if these are the current consumers of plant-based products, how can brands attract consumers who do not currently eat plant-based products?

Based on the same research, two of the main barriers to consumption are also taste and the ability to find relevant products (Marketbuzz, 2022). This suggests that stronger visual communication in the category might help potential consumers find the

right products more easily and even placing these products in proximity to the meat-based products that they replace (note: they are usually in a separate section of the freezer in retail stores).

Moreover, there is a large amount of evidence that while health is motivating for some consumers, for the majority taste is more persuasive (Turnwald et al., 2017; Turnwald et al., 2019). Turnwald and his collaborators have argued that “leading with taste” makes good public health policy to drive changes in consumption and this would apply to other aspects of sustainability too (Turnwald & Crum, 2019; Turnwald & Crum, 2021).

Which labels do consumers identify with?

As mentioned above, labels that focus on health and nutrition may not be the most effective messages for many consumers. Likewise the use of labels such as ‘plant-based’, ‘vegetarian’, and ‘vegan’ help those who identify with these dietary choices, they are often counterproductive in changing behaviours (de Boer et al., 2013; de Boer, et al., 2014; Sparkman & Walton, 2017b).

Many of the brands and products reviewed in this paper focus very strongly on their ‘plant-based’ credentials and often prominently display labels such as ‘vegan’ on their packaging in-store. The evidence is that while this may be attractive for those who identify with such labels it is not attractive to those who see themselves as carnivores, omnivores or flexitarians (who constitute the majority of Thailand’s population).

On the other side, there is also some evidence that prompting about ‘meat’, even in a negative context, may actually increase meat consumption (Ottersen, Benningstad & Kunst, 2022) and therefore the frequent use of meat in the naming of products could also be counterproductive, although this has yet to be properly tested in Thailand.

Can brands communicate sustainability more effectively?

Brands can and should use more effective visual communication strategies if they wish to encourage consumers to eat more sustainably. Visual communication can help build stronger storytelling elements into the messaging of plant-based products and this is an area where few of the brands studied are strong.

Although visual communication and storytelling are sometimes used, for example in the website and advertising of Beyond Meat and the visual look of Absolute Plant and First Pride, there are simpler ways for brands to trigger purchase and consumption. Eco-labels have been shown to be effective in driving consumption of sustainable food products (Potter et al., 2021).

This research also showed that a range of labels and messages may be required to target specific audiences. However, this research also shows that there are no consistent or standard eco-labels and quality marks. The extensive use of such messaging means that there is a need to be more targeted and focused in communication while minimising the number of messages to simplify consumer decision-making and reduce potential confusion.

The most important lesson from this review of communication in the plant-based food category is that there is too much focus on existing consumers and too little focus on attracting new customers. If the goal is to make diets more sustainable across the broader population, communication strategies must target a wider range of different segments within the population with clear and simple messages and more imagery that connects product benefits to sustainability and especially nature.

Conclusions and Recommendations

Summary of findings

Overall, these findings demonstrate that sustainability messaging in the plant-based food category is mostly limited to a focus on health and nutrition (SDG 3) and has yet to fully address issues of responsible consumption (SDG 12) and climate action (SDG 13). Taste is also an important message for this (and any food) category and combined with health and nutrition reflects the key triggers and barriers to consumer purchase.

Although interest in and consumption of meat alternatives is growing, there remains a large gap between the intentions and the actions of a large majority of the population who are not currently consuming meat alternatives. Given the huge benefits to the planet, society and individual health this gap needs to be closed and this research has identified a number of opportunities outlined in the recommendations below.

Recommendations

The recommendations from the research divide into actions that may require government action and those that focus on companies and brands and the effectiveness of their marketing and communications.

Firstly, there is an opportunity to provide clearer and more consistent labelling of sustainability credentials for plant-based foods and other categories. Consumers are currently faced with a deluge of flags, labels and quality marks which are different from product to product. This is likely to be causing information overload for many (Chernev, Böckenholt & Goodman, 2015), making it difficult to determine the most important messages especially when there is uncertainty about their underlying preferences.

While there is a need to test the effectiveness of different types of messages, there is strong, existing evidence that clear visual labelling of products can increase sustainable choices (De-loyde et al., 2022). This is also an opportunity for companies and brands to simplify their messaging and aid consumer decision-making with more focused, simple and visual messaging. As discussed, there is considerable evidence that identity labelling may not be effective for attracting new customers (de Boer et al., 2013; de Boer et al., 2014).

This provides opportunities to move away from targeting health and dietary preferences to more holistic messaging which combines the short-term benefits of plant-based products (e.g., taste) with the long-term benefits of responsible consumption and a sustainable environment (e.g., nature, health). Such messages may

be more attractive for those who currently reject the category. This applies to naming of brands and products as well as on-pack messaging through labels and quality marks.

For example, for communicating taste the use of more vivid sensory descriptors has been shown to be effective in driving consumption and enjoyment of foods (Turnwald & Crum, 2019; Turnwald & Crum, 2021). Would ‘plant-based meat katsu’ be more attractive as ‘crunchy and juicy meat katsu’ or ‘grilled meat stick’ as ‘succulent meat stick’?

Retail outlets and brands should consider the best locations to put products in-store. Should the plant-based sausages be in a separate section for plant-based products or next to the meat-based sausages? The former probably helps those who currently purchase products to find them quickly, while the latter probably helps those who do not regularly buy meat replacements.

Finally, using norm-based messaging may help new customers to decide to buy such products. While standard social norms may not be effective, with category consumers in the minority, communicating dynamic norms (trends) has been shown to be effective in promoting sustainable consumption (Sparkman & Walton, 2017a, 2017b) and is mentioned by consumers as a reason for purchase (Marketbuzz, 2022; Rakuten, 2022).

Limitations and future research

This review of products was limited to those available in the retail environment of Bangkok, although many of the products studied come from outside Bangkok including international products which represent just under one-half of the brands and one-third of the individual items reviewed. Messaging of brands outside Thailand was not included in this study and would provide an important comparison with these findings to see what alternative communication strategies may be effective.

The outlined recommendations should be tested to see which are most effective in the Thai market for promoting sustainable consumption across different segments of the population and especially those who currently avoid meat alternatives.

Finally, further research is needed to better understand individual consumers’ understanding of and associations with meat products and meat alternatives and the concept and different aspects of sustainability, in order to develop more targeted and effective communication strategies.

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Appendices

Table 1: List of brands, product variants, brief description of product type, and country of origin (in alphabetical order)

Brand name	Number of items	Description of products	Country of origin
Absolute Plant	4	Plant-based menu items	Thailand
Alpha	1	Plant-based nuggets	USA
Beyond Meat	3	Plant-based meat products	USA
Bird's Eye Green Cuisine	3	Plant-based meat products	UK
Broccoli Revolution	3	Restaurant decor and menu	Thailand
First Pride	4	Plant-based menu items	USA
Fry's	7	Plant-based meat products	UK
Harvest Gourmet (Nestle)	4	Plant-based meat products	Switzerland
Healthiful (Central Retail)	4	Plant-based ready meals	Thailand
Krop	7	Plant-based menu items	Thailand
Let's Plant Meat	7	Plant-based meat products	Thailand
Linda McCartney's	1	Vegetarian sausages	UK
Mantra	5	Plant-based meat products	Thailand
Meat Avatar	4	Plant-based meat products	Thailand
Meat Zero	9	Plant-based menu items	Thailand
Meatly (Betagro)	3	Plant-based meat products	Thailand
Meatoo	2	Plant-based ready meals	Thailand

MJ (Mudjai)	6	Mushroom-based menu items	Thailand
More Meat	1	Plant-based protein	Thailand
Morning Star Farms	3	Plant-based meat products	USA
Never Meat	7	Plant-based meat products	Thailand
NoMeat	1	Mushroom steaks	UK
OMG Meat	3	Plant-based menu items	Thailand
Omnimeat	2	Plant-based meat products	Canada
Plant Ever (Cargill)	2	Plant-based menu items	USA
Pranaa	1	Food delivery menu	Thailand
Quorn	5	Meat-free menu items	UK
So Good	1	Plant-based milk	Australia
Swees	5	Organic plant-based cheese	Thailand
V Farm	4	Plant-based menu items	UK

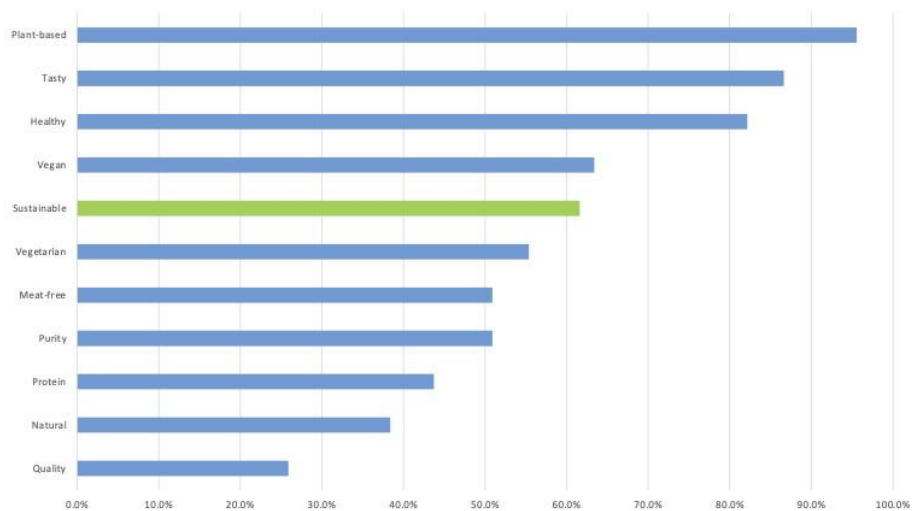


Figure 1: Visual and verbal communication messages for plant-based foods available in Thailand

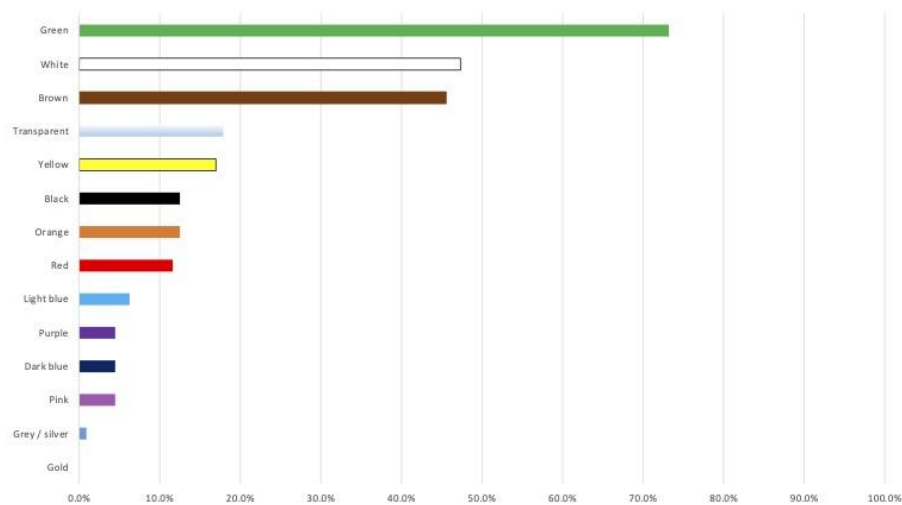


Figure 2: Packaging colours used for plant-based foods available in Thailand

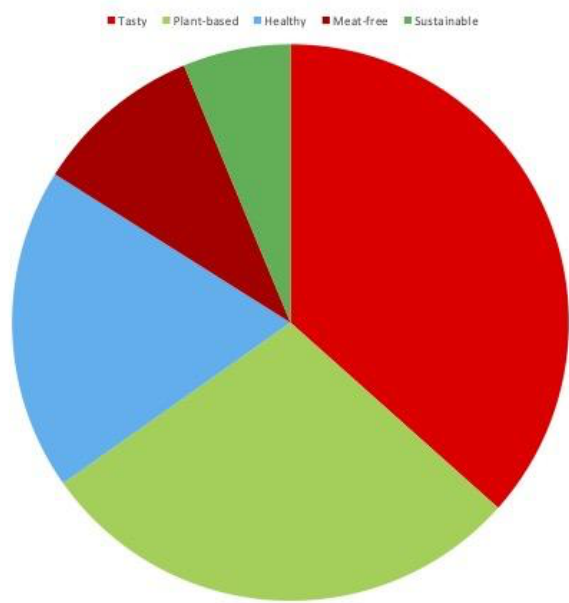


Figure 3: Dominant communication themes for plant-based foods available in Thailand



Figure 4: Krop Grilled Pork



Figure 5: First Pride Thai Taste Series



Figure 6: Let's Plant Meat Plant-Based Meat Katsu



Figure 7: Plant Ever Plant-Based Nuggets



Figure 8: OMG Meat Plant-Based Crab Shumai Style



Figure 9: Healthful The Porkless Grilled Pork



Figure 10: Meat Zero Plant-Based Crispy Pork



Figure 11: NoMeat No Bull Mushroom Steaks



Figure 12: Beyond Meat Beyond Sausage Plant-Based Links



Figure 13: Absolute Plant You're The Next Hero to Save the World

“Sookpracha” Valuable Housing for Holistic Life Development: Case Study Approach

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Abstract

One of the key factors reflecting the quality of human life is adequate housing but nowadays housing cost is too much higher than the household income, which becomes a burden on households and makes it difficult for low-income people to access quality housing. This study uses SSM as a research tool to find a problems and constraints in supporting affordable housing model in Thailand. The case study used in this article is from “Sookpracha” affordable housing project from National Housing Authority. The finding from rich picture found that collaboration from stakeholders at all levels either in government, private sector or dwellers plays great role in encouraging affordable housing. The rental housing model and use of land with sunk cost on location of the project also supports BCG model in dimension of circular economy. Moreover, physical disability, household income, age, and type of family should be considered as important factors in making tailor-design house for vulnerable group.

Keywords: Affordable Housing, BCG, House for Low-income, House Affordability, Circular Economy

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Introduction

Housing is the key factor reflecting the quality of human lives based on the economic, social and environmental conditions. Affordable housing is one of the most Important conditions that will help people in the country access the education, health benefits and social welfare they deserve to receive. (UN-Habitat, 2022) Alina et al. (2021) indicated that people perceived the quality of life in many dimensions including physical, mental or social. Accordingly, Carter and Polevychok (2004) suggested that if people can access to quality housing at appropriate price compared to their income level, it will help them reduce the burden of exceeding expenses.

While considering the housing issues in the current global context, by 2030 more than 3 billion people or 40 percent of the world will have a greater need for housing. It is estimated that 96,000 homes per day for low-income residents will increase. Additionally, more than 100 million people worldwide are homeless and facing health and safety risks. This is due to the urbanization trends and increasing unemployment rate including the lack of sufficient income to sustain a quality of life. As a result, approximately by the year 2025 more than one third of the world's population will suffer from financial difficulties and unable to access secure housing (McKinsey Global Institute, 2014).

Besides, the Covid-19 situation affect liquidity and business operations in many sectors, especially in the tourism service sector and small and medium-sized enterprises (SMEs), this has caused unemployment in many groups of people, particularly vulnerable or low-income groups. Especially, Thailand's unemployment in the second quarter of 2020 increased by 1.95%, or 0.75 million, which is a one-fold increase compared to the normal unemployment rate. This is considered to be the highest since 2009. (NESDC, 2020) According to abovementioned statistic, many groups of people are encountering fragile financial situation such as elderly people, disabled people, unemployed, single parents, students, who are have difficulty accessing resources and are more likely to be discarded from society than other peoples. (Fratczak Muller, 2022). In addition, over the past 10 years, Thailand's number of poor people has remained stable at around 4.8 million and the poverty line at 2,762 baht per month. (NESDC, 2021) Many households in the country are still unable to recover or get back to normal as before. Moreover, household debt has increased from 45.2 percent in 2019 to 51.5 percent in 2021, reflecting the vulnerability of income and the potential of people to spend in the country.

Especially the "Housing debt" that accounts for 34.5 percent is considered to be the largest percentage of household debt which is reflecting the growing burden of housing costs from past to present. (Kasikorn Research Center, 2022) In addition, when considering the cost-to-income ratio, the lowest-income households had 24 percent of their total income for housing. It seems that housing expenses is higher than labor income significantly. From 2013 to 2019, condominium price indexes and townhouses and land plots grew by an average of 6.3 and 5.9 percent per year, respectively, this

was higher than the growth rate of labor income that grew only 2.3 percent per year (BOT, 2019). This reflects that people or households in the country have a harder time in affording house. It also leads to less savings for other investments. Unemployment and loss of income in such situations leads to poverty and access to stable housing. (Puey Ungphakorn Institute for Economic Research, 2021)

This situation has led to initiation of the National Housing Authority's 20-Year Strategic Plan (2017), which aims to design and build 2.2 million homes for those people in this group. The needs of more than 5.8 million low-income or poor people in a country that lacks stable housing. For this reason, it brings "Sookpracha Affordable Housing Project" to support low-income group for instance; the elderly, the handicapped, the homeless, the socially disadvantaged including those affected by COVID-19 in access to more stable housing including raising the level of household income above poverty line which is estimatedly 24,500 baht per month. This project is operated under the supervision of Keha Sookpracha Public Company Limited, which aims to build high standard rental houses at affordable prices by raising household incomes with two main concepts: "The Concept of Baan Sookpracha" or low-cost high-standard rental houses with living space and "The concept of a healthy economy". To provide residents with a house, a career, income, happiness through income generating considering the appropriateness or potential of that area, such as organic agriculture, livestock, small industries such as mulberry paper, sandalwood flowers, sewing, etc. Moreover, the organization not only offers home rental services but also provides financial support for renting land to encourage career opportunities, develop skills and knowledge, foster knowledge exchange within the community, and facilitate market access. Their products will be distributed through housing communities across the country and benefit around one million families. These efforts aim to establish a sustainable ecosystem that empowers local individuals to earn a livelihood. (NHA, 2017)

Sookpracha Housing is one of the projects from National Housing Authority that designs affordable rental homes for low-income people based on the concept of BCG economy, with an emphasis on value-based economy, participation of people or stakeholders from all dimensions (Inclusive Growth) and support a circular society. (MHESI, 2021) As well as supporting the Sustainable Development Goals (SDGs) on making cities and human settlements safe, inclusive, transformative and sustainable. It is in line with the 20-year national strategy (2018-2037) in the strategy of creating opportunities for social equality. The first goal is to create fairness and reduce inequality in all dimensions building growth on the basis of quality of life that are environmentally friendly. Another goal is to make advantage and generate growth on the basis of natural resources and the environment to balance under the capacity of the ecosystem. It also promotes an ad support master plan under the national strategy focusing on people's employment including vulnerable people by developing the potential and quality of life of people in the country through integrated housing. At the same time, helping people affected by the COVID-19 situation to support income

stability and the necessity of living through improvement and development of fundamentals in the dimension of living through the application of knowledge and innovation. Together with encouraging participation from all sectors to integrate work and deliver affordable housing that truly meet consumer's needs (NESDC, 2021).

Objectives

- 1) To study the concept of affordable housing with career from Sookpracha
- 2) To evaluate the characteristics of Sookpracha based on BCG economy concept

Literature Review

Affordable Housing

The general definition of affordable housing is a home of quality and a suitable location with reasonable price that is not so high that becoming a burden and exceeding expenses. Making it impossible for residents to manage their money for basic living cost in other dimensions and balancing residents' well-being and basic human rights. (UN Habitat, 2019)

However, the definition of a housing for low-income can be considered from a variety of perspectives. According to each individual consideration or according to each country shall be defined. Another commonly understood definition is homes that low-income earners can access, rent and live in. This is because the rent and household income are at a reasonable level, that is, the rent price is neither too high nor too expensive for the household to be able to spend regardless of whether it is a burden or excess. (Lăzărescu, Luminița-Mirela et al., 2020)

However, the issue of housing affordability is involved in the design of homes for low-income people, land, materials, equipment and the network used in construction. For financial dimensions consist of interest rates on homes land contract and service fees for each time to build a house which affect the cost of production for each house.

Generally, when it comes to evaluate people's ability in access housing in a country, they might use the composition of the housing cost and household income in considering the comparison. For example, a country where land prices and construction costs are high but people in the country have low incomes. As a result, people's ability to access homes or housing in the country is relatively lower than in other countries. It is also found that the housing related expenses should not be more than 30 percent of the total income per household. Otherwise, it will be considered a hard-to-reach house for the people of the country (UN Habitat, 2019).

In summary, housing problems can generally be considered from three perspectives: an economic perspective, which is often seen in the form of rental or selling prices of homes that are higher than housing cost. Secondly problem of balancing demand and supply for affordable housing in the market that is not sufficient to meet the needs of people in low income groups. Finally consumer expenses such as water and electricity bills that become a burden for residents. From a demographic point of view, the expansion or contraction of family size for example, countries with more single-family tendencies have greater demand for homes or housing (Household Size Dynamic). It manifests itself as a shortage of land suitable for building affordable homes for low-income earners. (UN Habitat, 2011)

From the point of view of government policy, driving the issue of access to homes or housing for people in the country requires the involvement of the public and private sectors. To support the provision of affordable homes that are not burdensome, and promote the quality of life of the people in the country. On the contrary, if the government neglects to focus on the home in such a way, It will also open up opportunities and space for the private sector to build homes at a price that exceeds the proportion of household income. Especially for low-income groups, resulting in access to standard, quality housing, along with an environment that promotes quality of life in terms of occupation and livelihood. Therefore, governments of all countries should consider providing housing for low-income people to support the goal of building a participatory city and meet the needs of all groups of people, including those who are considered in vulnerable group. (UN Habitat, 2019)

BCG Model

The new BCG economy model is a concept that Thailand uses to develop the country's economy and society based on the Sustainable Development Goals (SDGs) in line with the Sufficiency Economy (SEP) by upgrading products and services to create a value-based economy from upstream to downstream from biodiversity and diversity resources. Focus on a circular economy society, as well as develop the value chain by applying digital technology. Reduce gaps and restrictions in national development create sustainable economic growth Support the distribution of income, opportunity and wealth (Inclusive Growth) (MHESI, 2021). In addition, the BCG economic concept consists of three main economic development goals as; (NSTDA, 2021)

1) *Bio-economy* or an economy that focuses on the cost-effective use of biological resources. Applying knowledge in life sciences to develop or create added value from agricultural products or biological resources to become products and services that can be utilized in agriculture, food, medicine and energy.

2) *Circular Economy* or an economic system that focuses on the use of resources throughout the life cycle. Focusing on bringing raw materials or waste back to add value. Reducing the amount of waste in the environment (NSTDA, 2021). The

examples of the circular economy model include innovation development, product life extension, sharing economy, resource recovery and sales.

3) *Green Economy* or an economic system that focuses on solving pollution problems and balancing social and environmental. Solving the problems with the depletion of resources such as food, energy, agricultural land. and housing as well as the problem of wasting resources release of waste into the environment.

In terms of strategies and programs driven by the BCG economy concept that is consistent with affordable housing; Strategy number 1 is for sustainability of the resource. Reusing old resources with the principle of resource rotation and developing a sustainable resource management system. Strategy number 2 is community development and strengthen the economy through capital resources, identity, creativity and new technology in each area depending on its resources, biodiversity and culture, as well as upgrading the production chain of goods and the delivery of value-added services through technology and creativity. Focusing on issues of participation and answer all groups of people in different sectors without leaving anyone behind. to provide opportunities for people in the country to improve the quality of life thoroughly and equally. The relevant work plan is to increase the food security, health, energy of the community. (NSTDA, 2021).

The origin of the Sookpracha Affordable Housing Project

National Housing Authority “Sookpracha Affordable Housing Project” is a rental housing project for low-income residents in order to create housing security for low-income people during the country's economic impact from the Covid-19 epidemic. Its aim is to support the elderly, the disabled, and the low-level civil servants or retired civil servant, low-income people, public space invaders, socially disadvantaged including those affected by COVID-19 to have more stability in housing. Through the operation of Housing Sookpracha Public Company Limited with a model of renting a house with a living area at a rental price that can bear the burden. Upgrading the economic potential of the integrated household by providing a source of funds to rent the land for making a career. Build a body of knowledge for occupation development, doing knowledge sharing, providing marketplace, product distribution channels through housing communities of 1 million families across the country. To create a living ecosystem that truly supports the local people to earn income and support their families. Support low-income people to have arable land and elevate oneself through the poverty line by building rental houses and managing communities through integrated economic development for low-income communities. It also proposes to the government that in a period of 5 years (2021-2025), 100,000 happy homes across the country will be built. It is expected that low-income earners will have at least 20,000 additional homes per year per family under the management of Sookpracha Housing Public Company Limited, a subsidiary of the National Housing Authority. (NHA, 2021)

Establishment of Sookpracha Housing Company Limited

Sookpracha Housing Public Company Limited was established to increase efficiency in housing project development and business administration to generate income for the National Housing Authority. There are 5 main objectives which are real estate business development, community economy building, community management, distribution system management and raising funds from the money market to reduce the burden of government debt. Having duties in managing the business in 3 areas: sponsoring the development of real estate in the residential sector, focusing on low-income people in the housing project, Sookpracha or other projects, being a community economic developer and proceeding to provide benefits in business development in the Sookpracha Housing Project and the last one is to manage and take care of the community, being juristic person, providing after sales service of the Sookpracha Housing Project in order to create income balance of the development of companies in the National Housing Authority. However, the operation of Housing Sookpracha Company Limited is a project to develop rental housing for low-income residents at Baan Sookpracha House. After the establishment of the company, the National Housing Authority will continue to operate under its main mission, which is to develop housing for the people. Especially those with low income as well as to strengthen the community of the National Housing Authority self-reliant and restore the urban community to have a good environment and develop a new city to support the growth of the city in the future.

In addition, the business operation of Housing Sookpracha Public Company Limited also supports the policy of the State Enterprise Policy Office (SAO) to increase efficiency of state enterprises and create added value to state assets as well as to promote and support the private sector to invest in state affairs. This allows the National Housing Authority to expand the base of housing development and improve the quality of life of people in the community in the future. It also increases the potential to expand the scope of housing development to cover more target groups as well as creating knowledge, expertise and experience for personnel in operations with the form of a public limited company with a clearer structure and more flexibility. This will contribute to decision making in housing project development Including investment in suitable projects in the future quickly and efficiently. Being another channel that supports the National Housing Authority to increase efficiency in housing development faster and more efficiently.

The impact of the establishment of a public health housing company on society is the reduction of inequality. Create fairness and social equality improve the quality of life in housing from having standard housing in a community with suitable environment and utilities. Building social stability in a strong community through systematic and efficient management. Incentives for residents to support higher education for low-income children especially the bachelor's degree because parents see that they have the opportunity to own a residence and have a job. Therefore, there is an expectation to create a better future with their children better than their own, earning more than their own. It also helps to adjust the status of low-income people. Build morale by having

security in your home as a driving force in your career and living with human dignity and promote the well-being of society. Promoting democracy through the process of participation in accordance with the rights and duties of the people Reduce crime (NHA, 2021)

The concept of “Sookpracha Economy”

It is an economic concept that focuses on creating jobs and household income for the residents of the project. To create a change in the quality of life, restore the foundation, develop innovative technology with a sustainable agro-industrial approach based on the concept of 4 main points: 1) building houses, creating jobs, generating income for people in the project, 2) building a community market for trading and exporting community products and 3) building a community light industry center with agricultural plots adjacent to housing to create jobs and income; and 4) commerce for the community.

In terms of comprehensive community economic development, it can be divided into 6 forms of occupation based on specific arable land; organic farming (eg. short-term crops, annual crops, perennial fruits), livestock (eg. chicken eggs, quail eggs, duck eggs, catfish, tilapia), market stalls or parking lots, small shopping centers or wholesale and retail shopping centers (eg. mini malls, distribution centers) community service professionals and neighboring communities. (elderly care or cleaning service). Including small industries (eg. sandalwood flowers, sewing) by granting the first priority to residents of the Sookpracha Housing Project. Focus on home rental services procurement of funds for renting land for making a career. Build a body of knowledge for occupational development, doing knowledge sharing, providing marketplace, product distribution channels through communities across the country including control, supervision, monitoring and evaluation. (NHA, 2021)

Target Group

Sookpracha affordable housing has a clear target group as “Vulnerable People”. In order to encourage the welfare of the people and reduce the disparity in access to housing for people in the country, they are divided into 5 main groups, namely, the elderly or disabled, the group intruders in public places, the minority or retired civil servants, the expropriated or demolished people and low-income groups who want to have a job. The National Housing Authority also *"Analyze the behavior of the target customers"* by considering the context of the housing market, which plays an important role and is a market with intense competition. Because of the habitat, which is one of the four important factors in human life, housing is therefore a product that is in constant demand. As a result, developers of residential real estate projects need to develop projects in accordance with the needs of consumers as well. Therefore, the National Housing Authority has studied consumer behavior in choosing rental housing. The main factors were taken into account: 1) location close to occupation, workplace and public transport, 2) size and usable area of the house. The National Housing

Authority has prepared a housing model for the Sookpracha House, designed according to the needs of residents such as the elderly, the disabled, the newly married couple, the single family, the extended family, including the single father or mother, 3) Construction quality, design, materials used in construction. The National Housing Authority has focused on the use of quality and standardized safety technology. energy saving environmentally friendly including developing attractive housing styles, 4) near amenities or community resources; the National Housing Authority has provided public utilities, utilities and environments that meet the standards of service to residents within the project. and 5) the purchasing price or the total rental price and its value. The National Housing Authority has set rental rates that are cheaper than private projects. and make a difference in the Sookpracha housing project by developing a comprehensive housing. Build a housing structure with a career to generate income for the household and to comply with the epidemic situation of COVID-19 coupled with the economic recession. This could lead to consumers or residents becoming interested in renting housing that is cheap and cost-effective (NHA, 2021).

In addition to analyzing the behavior of the target audience, National Housing Authority also "*Analyze of residents by area*" (*Trade Area*) as well, in the main target area (Primary Market) accounted for 80 percent, which consists of 3 subgroups: 1) the first group is a group that wants to start a new family while also wanting to be closed to their parents. However they don't want to buy a permanent residence accounted for 35 percent., 2) the second group includes groups who work and study around the Sookpracha Housing Project, such as industrial estates, schools, government offices mall establishments, and others accounted for 35% and 3) the last group is ca group consist of elderly or handicapped who live near the Sookpracha Housing Project area. This will be a group of customers who tend to live in rental houses of the Sookpracha Housing Project about 10 percent. The other 20 percent will come from the surrounding leased areas (Secondary Market) or customers who are interested in the project location with the conditions of the project near the transportation network source. (NHA, 2021)

Table 1: Housing type in the project

Type	Characteristics	Size	Target	Monthly Rental Rate
X	Studio for Senior	Standard land plot size 16 sq m., usable area approximately 30 sq m.	Elderly/Disabled Person	1,500 Baht
A	Studio for Single		Single	2,000 Baht
B	1-bedroom for Couple	Standard land plot size 17.5 sq m. Usable area approximately 40 sq m.	New/Single Family	2,500 Baht
C	2-bedroom for Family	Standard land plot size 20 sq m., usable area approximately 50 sq m.	Extended Family	3,500 Baht

Source: NHA (2021)

**Figure 1:** Example of type 2B (1-bedroom for Couple)

Source: Matichon Online (2021)

The Sookpracha Affordable Housing Project has set criteria, qualifications and conditions for joining the rental housing project for low-income earners. The pilot project covers various issues such as being a Thai citizen, people affected by the

economic recession due to the epidemic situation of COVID-19 in the form of termination of employment, change of occupation, relocation, decreased income, etc. Otherwise, unemployed people being in a single-parent family status, a disabled person, an elderly person, or a person affected by the eviction retired civil servant including having to be a person of legal age who able to make a legal contract with the National Housing Authority. According to the law, the renter will not earn more than 30,000 baht per month per household from self-certified and proven documents from the National Housing Authority in order to confirm that these groups truly needs a home for low-income earners.

Example of pilot project



Figure 2: Sookpracha Romklao

Source: Terra BKK Online (2021)

At present, the Sookpracha Housing Project has carried out two pilot projects, namely, Baan Sook Pracha Chalong Krung and Baan Sook Pracha Romklao. There are also 21 projects that are open for registration throughout the country, such as Pathum Thani, Chachoengsao, Chiang Mai, Rayong, Phra Nakhon Si Ayutthaya, Chonburi, Samut Prakan, Nakhon Pathom, Narathiwat, Kamphaeng Phet, Saraburi, Mae Hong Son, Nakhon Si Thammarat and Phetchabun. The location of the Sookpracha housing

project is mostly close to the center of the economic district that is the source of work. Large activity centers, educational institutions and government offices as well as having a variety of communication network systems connecting to travel is quite convenient. This reduces energy consumption and costs of tenants or residents. For example, the Sookpracha Romklao housing project located in the urban and community areas has therefore built a mini mall in the community to allow community enterprises to bring their products to sell within the area. This is to create a career to increase income. Training centers and vocational training centers have also been established to create careers for residents in the community. Under the supervision and support of the National Housing Authority to receive such products to be sold in mini-malls. (MGR Online, 2022)

However, the operation in the first phase of Housing Sookpracha Public Company Limited will focus on "Development of housing for low-income people" to solve the housing problems of people in countries affected by economic recession. Due to the situation of the epidemic of COVID-19 Including focusing on building standards in the community to have an appropriate environment . Supporting facilities to drive the community economy in parallel by integrating all sectors into “Value Chain”. Apply the use of project areas based on the concept of the healthy economy to generate income as well as defining the asset benefit management model in order to create a model community management model in each sector to harmonize. Focus on upgrading the community to become a strong community that can be self-reliant and sustainable in terms of economy, quality of life and environment. Generate income from both inside and outside the community. Uplift the quality of life and environment to become a clean, orderly community with a waste management system. Create green spaces Recreational area free from drugs, malice and crime in the community. Including aiming to solve the problem of sunk cost by renovating and using an aggressive sales model to encourage people in accessing to affordable housing. (NHA, 2021)

Integration and Networking

The Sookpracha Affordable Housing Project is a rental housing project for low-income earners through creating shared values between government agencies, the private sector and customers. Integrating cooperation in various processes such as building a network of trade alliances, knowledge and innovation. Sharing resources in order to create added value for the organization, activities that are integrated with other sectors can be classified as follows:

1) *Construction process*: A network is established between manufacturers and suppliers of building materials as well as connecting and transferring effective technology from experienced and skilled entrepreneurs.

2) *Operating community*: There is a network of cooperation with network partners in the public sector, the private sector, and local government organizations.

3) *Holistic community economic development*: Through financing process knowledge creation, practice, control, supervision and monitoring as well as a channel for distributing products to the digital marketplace through requesting cooperation and support for occupational loan sources from financial institutions. Building a network of associates with people with specific expertise in accordance with the concept of the healthy economy. Including integrating cooperation with both public and private agencies to create both conventional and digital distribution channels. (NHA, 2021)

Methodology

This research use Soft System Methodology (SSM) as research tool because it is a study of low-income housing models that are related to issues from a variety of dimensions; economic, social, geography, environment, including demographics. It is also a problem that depends on the individual which can be viewed from a variety of subjective perspectives. In addition, SSM is a tool that helps to simplify the model or process of designing such a house that reflects the problem and the origin of the solution (Complex Unstructured Problems) through a diagram of the relationship between actors and those involved. Activities, actions, and problems and limitations encountered by the project will help to visualize and explain the source of the problem more easily. For example, a study that examined a case study of low-income homes in India. They also use the diagram to find and describe the problems driving low-income housing projects. (Sookanya Ghosh et al, 2016)

However, generally SSM consists of 7 analytical processes. (Peter Checkland & John Poulter, 2020) In this study, the problem situation is unstructured in **stage 1** to examine with most open and unbiased way. Initially, it is necessary to construct a depiction of the complicated situation which commonly referred to as a "rich picture" in **stage 2** to get the full perspective of the situation from the people involved. The rich picture also shows the relationships, cause-and-effect and connections in each situation. With CATWOE Checklist in **stage 3**, the rich picture was drawn by the root definition of Customer, Actors, Transformation Process, Worldview, Owners and Environment Constraints. In **stage 4**, conceptual models were built by matching the activities and verbs in a proper order. Then compared it with rich picture that were drawn in stage 2 and add some inferences if needed to complete **stage 5**. Next in **stage 6**, the rich picture was brought to debate with stakeholders such as representatives from NHA, Sookpracha housing public company limited, low-income dwellers, financial institution and ministry of social development and human security. Finally in **stage 7**, the ideas from the debate lead to implementation of agreed changes in structures, procedures, policy and attitude.

Finding

The case study, “Sookpracha Affordable Housing Project” is an example of an affordable housing project in Thailand that illustrates the efforts and objectives of the government to support vulnerable populations in accessing housing and a better quality of life. Including showing problems or the origin of the push for housing projects for low-income people in such a manner which appears to be stakeholders or those involved from many sectors together in the drive of the public health housing project. In perspective of the National Housing Authority or considered as a service provider from the government, it was found that the aim is to provide homes that are affordable, accessible and suitable for low-income earners which is currently divided into 4 characteristics by tailor-made design. These include homes for the elderly, the handicapped, the single, the new family, the single family and extended family. The design of houses in the Sookpracha Affordable Housing Project takes into account the spatial benefits, usability and facilities that are truly suitable for each group of residents.

It also focuses on the quality of houses and other services such as providing jobs suitable for each area, such as supporting agricultural occupations, growing vegetables in projects located in Nakhon Pathom province due to the environment, geography, or potential that are suitable for occupation. For example, the housing project at Romklao community that supports trade as a community state enterprise. To provide a market for goods and services for residents in the area according to their knowledge, expertise, ability, and deliverable products or services, such as Thai massage services. Baan Eua Athon Romklao 2 Community Center that has been in operation since 2011 from the integration of massage experiments. Currently, the National Housing Authority has supported cheap rental rooms to formally open for service.

In addition, the Sookpracha Affordable Housing Project will help solve the problem of housing prices higher than household income by supporting cheap houses for low-income earners. The project also focuses on the safety system and village management resulted from the government's objectives to promote the well-being of people in the community along with the safety of life and property. Including having standard utilities and consumer products that are clean, safe, hygienic, have an environmental management system, waste separation and recycling to support a truly green economy (Green Economy). Promote learning system from a school or institution close to home with quality and affordable prices (Education). Including public health systems or hospitals (Healthcare Service) and social welfare for communities in that area (Social Security) in a comprehensive way to reduce inequalities in access to resources and to improve the quality of life of residents in Project to be equal with people in other areas.

According to table 2 showing the latest registration for Sookpracha House, more than 6,600 people were interested in booking rights out of the total of 500 houses open for reservation. Type C House or 2-bedroom for Family is apparently in high demand

both in Romklao and Chalongkrung with more than 57% applicants in person from each project. (Table 2) For this reason, the National Housing Authority has set up a subsidiary that is a public company. to speed up funding to build houses for low-income people to meet the aforementioned needs.

Table 2: Number of applicants at the registration of Sookpracha in Romklao and Chalongkrung

Project	Number of Applicants (Person)	Type*	Amount (Person)	Percentage
Sookpracha Romklao	4,285	C	2,444	57
		B	1,117	26.1
		X	396	9.2
		A	328	7.7
Sookpracha Chalongkrung	2,342	C	1,343	57.3
		B	637	27.2
		A	197	8.4
		X	165	7.1

Source: Thansettakij (2021)

Meanwhile From the point of view of low-income residents, there is a need for such homes as well. However, the focus is on understanding lifestyles, needs, occupations, families, as well as areas or locations suitable for such groups (Livelihood Pattern). This is especially the family issue where some residents wish to live with their families. The design of a house that responds to such needs requires consideration of the number of residents as well. Considering the case study of the Preliminary Housing Health Project, it was found that it was somewhat involved in linking or supporting the concept of the BCG economy which can be summarized as shown in the table 3.

Table 3: Analysis of the connection with the concept of BCG economy

	Design	Target Group	Operation
Value-based Economy	Using abandoned or unused areas for the benefit of the government to make affordable housing projects (Sunk Cost)	Design houses according to the characteristics of residents for spatial purposes such as single/families expansion.	Providing housing and occupation suitable for each area including markets to support goods and services from that community
Circular Society	Rental patterns and living conditions facilitate the circulation of housing resources in the country	-	Design an ecosystem (Ecosystem) by setting a ceiling on income that can be received from living in the Sookpracha Affordable Housing Project calculated from the arable land that varies according to the type of occupation in the project.
Inclusive Growth	Civilized house design for the disabled and the elderly	Emphasis is placed on low-income groups and vulnerable groups of society such as the elderly, the handicapped and the invaders of public spaces, etc.	Integrate cooperation between government agencies, the private sector and residents. in terms of construction, community care, comprehensive community economic development

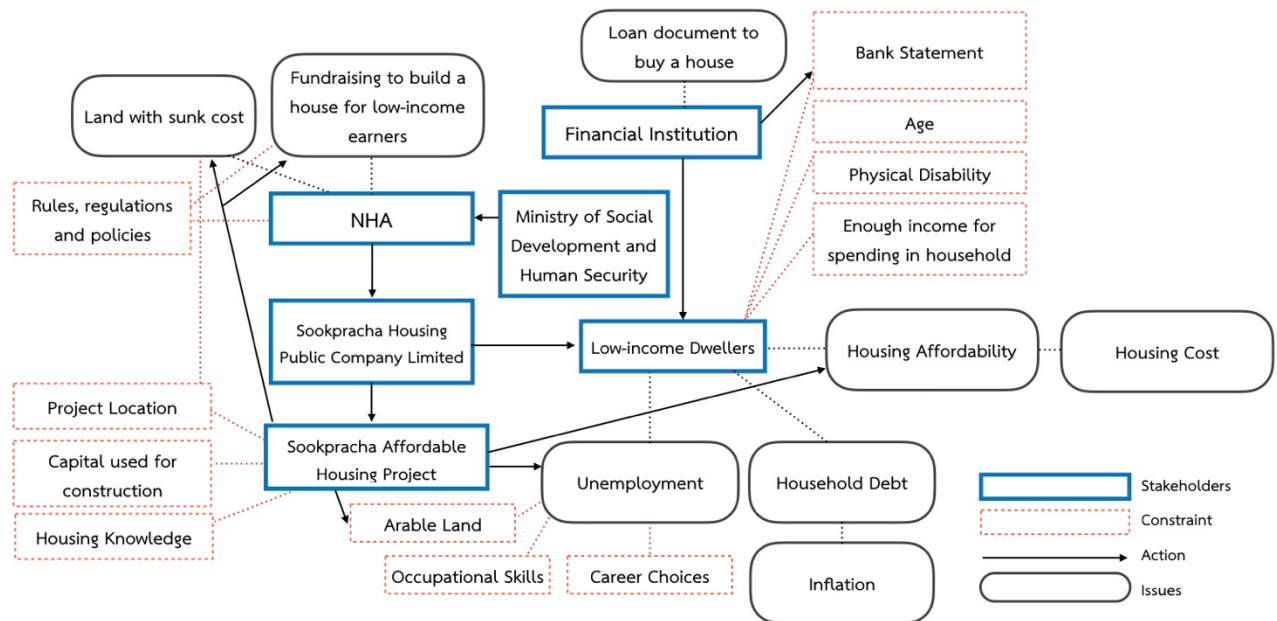


Figure 3:

Rich Picture from the analysis of the Sookpracha Affordable Housing Project

The Rich Picture diagram above can explain the main issues that stakeholders face (Problem Situation), with the Health Pracha Housing Project or the Low-Income Home Project as the main issue for consideration. It does not cover all issues but focuses on the main issues that should be considered in order to develop and extend the project in the future. The Rich Picture drawing style has no fixed rules, no drawing frame. In other words, according to the researcher's analysis and consideration, from the figure, it can be seen that the main issues used in the consideration are 1) stakeholders, 2) limitations, 3) action, and 4) issues found in such situations.

The Rich Picture diagram above depicts the situation or surroundings of the Sookpracha Housing Project. The main stakeholders brought to consideration is both from government sector as a service provider and low-income dwellers (table 4). The informants from government sector were chosen by the criteria of being responsible for activities related to provide housing for low-income people. The representatives are totally in 3 person from NHA, Sookpracha Housing Public Company Limited and Ministry of Social Development and Human Security. While the low-income dwellers were chosen by the criteria of those whose income doesn't meet the poverty line or 2,762 baht per month for totally 5 person. As a result of drawing such diagrams (Rich Picture), it shows the problems or issues including limitations or constraints that occurred in the beginning, during and delivery of the Sookpracha Affordable Housing Project. The perspectives can be divided into two main perspectives, which are the view from the government sector or service providers and the perspective from consumers or low-income residents as shown in the table 4.

Table 4: Problems and limitations in driving housing projects for low-income earners

Government Perspective		Low-income Dwellers	
Issues	Constraints	Issues	Constraints
Government Operation	Rules, regulations and policies	The context of low-income dwellers	Enough income for spending in household
Fundraising to build a house for low-income earners			
Building a house for low-income people to meet the needs of consumers in the market	Capital used for construction		Age
	Housing Knowledge		Physical Disability
	Project Location		Stable income for house loan
Unemployment		Occupational Skills	
		Career Choices	
	Land with sunk cost		Arable Land/ Employment Channel

By considering the rich picture, issues and constraints both from government and low-income dwellers perspectives, the characteristics of Sookpracha housing project is related to BCG concepts as shown in table 3. For example; land with sunk cost is one of the issues from government perspective (table 4) which can be beneficial if used in affordable housing projects. Secondly, affordable housing with career and providing arable land to support occupations encourage dwellers to have enough income which is one of the constraints (table 4). Moreover, the design of the house that takes the physical disability into consideration drives the inclusive growth especially in vulnerable group of dwellers (table 3).

Conclusion and Recommendation

The concept of affordable housing with career from Sookpracha is related to the case study from India (Gopalan, 2014) focusing on the environmental sustainability in housing design and affordable construction technology. As mentioned in table 3, Sookpracha's design concept prioritizes the needs of disabled and elderly individuals through a civilized house design. Furthermore, the Sookpracha ecosystem promotes circularity by establishing income ceilings for individuals who are capable of supporting themselves and willing to relocate to other areas. While in many countries, affordable housing was only to provide housing and financial support (OECD, 2019). In contrast with Sookpracha, it offers housing with career which encourages low-income people to earn a living in a sustainable way.

For the recommendation, the analysis of the Rich Picture problem found that the decision-making process to provide housing for low-income earners requires collaboration from government stakeholders at all levels (Multi-Level Governance). Decentralization should be done so that each area can design housing for low-income residents in a timely manner with their needs and contexts surrounding at that time. Moreover, affordable housing project should consider the need to provide more services in the dimension of health promotion to improve the quality of life of the low-income group more comprehensively in order to prepare for an aging society, which may affect consumers who are in such groups more in the future. Finally, the government should support policy adjustments in line with funding guidelines for low-income housing to the private sector.

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Currency Devaluation: A Case Study of Excessive Money Supply and Exchange Rate Pass-Through (ERPT) Inflationary Effect

Inpong Luanglath*

Abstract

This is a case study of currency devaluation and inflationary pressure as precursors to economic recession. The purpose of this paper is to explore possible policy tools against currency devaluation and inflationary pressure. We selected Laos as a proxy country to explore the interrelationship between currencies through exchange rates against the US dollar. These currencies include Laotian kip (LAK), Chinese renminbi (CNY), Japanese yen (JYN), Singapore dollars (SGD), Thai baht (THB), Vietnamese dong (VND), and the Euro (EUR) trading against the US dollar. The weekly spot rates of exchange rates from January 1, 2012 to May 22, 2022. The sample size included 543 weeks of Asian currencies and EUR against US dollars. We employed Weibull distribution as a tool for constructing a times series equation for the individual currency exchange patterns against the US dollar. We found that the long-term equilibrium point for the Lao currency is $8,541 \pm 928.46$ compared to its last spot rate of 13,240 or devalued by 55%. Among seven currencies commonly traded in Laos, we found that there are 4 currencies that significantly correlated with LAK, namely CNY, SGD, VND, and EUR with T values of 9.06, 10.61, 17.70, and 10.20 or $p = 0.000$ in all cases and R squared was 0.52. We also found that LAK has a tail index of 5.66 under Extreme Value Theory (EVT) and is Frechet distributed with the shape parameter for LAK is $= -0.18$; scale $= -130.57$; and location $= 11,216.32$. With the last spot rate at 13,240, LAK faces 18% exchange rate pass-through (ERPT) inflationary pressure. These findings suggest that further devaluation of LAK is expected. The finding of this study is a reminder for all ASEAN countries that excessive foreign currency reserve and rapid increase of money supply (M1) may lead to uncontrollable local currency devaluation.

Keywords: Currency devaluation, ERPT, exchange rate, extreme value theory (EVT), Frechet distribution, inflation, money supply, pass-through, Weibull distribution

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Introduction

This paper is a case study of currency devaluation. We select LAK, a currency of Laos as a proxy to carry our analysis. We used a cohort of other currencies in Asia to track the movement of a set of currencies against the US dollar over the same period of 10 years. We used weekly average of the spot rate; the sample size is comprised of 543 spot price of 543 weeks from January 1, 2012 to May 22, 2022. LAK has been devalued significantly for the past 33 weeks in the sampled period. This devaluation puts pressure on the country's because it depends on imports of fuels and consumer goods. As LAK is devalue, the cost of living rises as the result of the effect of exchange rate pass-through effect (ERPT). Unless effective policy tools are implemented to stem the tide of currency devaluation, we might be witnessing economic depression in Laos.

Laos is an interesting case study for currency exchange management because the country depends on imports of consumer goods and had consistently experience negative term of trade. More over, in the past 10 years, its currency had been stable traded against the US dollar at about 8,540 LAK per US dollar. However, since October 2021 the LAK has been significantly devalued ($p < 0.05$). In the same period, the money supply (M1) in the market also had increased by over 5000%; this increase in M1 coupled with no change in interest rate may have contributed to the devaluation of LAK. In this paper, we examine the devaluation of LAK from the perspective of policy tool search for effective means to stem the tide of LAK devaluation. We selected relevant Asian currency as proxies of possible baskets of currencies.

The money supply (M1) of Laos was 1.607 billion US dollars in Dec 2021. This represents an increase from 1.558 billion US dollars for September 2021. The data reached an all-time high of 1.651 billion USD in Dec 2020 and a record low of 28.814 million USD in Dec 1999 (CEIC Data, 2022). If we tracked M1 expansion between 2019 and 2021, we found that in 2019, M1 of Laos stood at 28.814 million USD; by 2020, this number expanded to 1.651 billion USD, representing a change of $((28,814,000 - 1,651,000,000)/28,814,000)*100 = 5,629.85\%$ between 2019 and 2020. The change between 2019 and 2021 is $((28,814,000 - 1,607,000,000)/28,814,000)*100 = 5,477.15\%$. This paper contends that this M1 expansion is one of the main causes for the extreme devaluation of LAK in the second quarter of 2022. We argue that the devaluation resulted from 2 factors, namely the increase in money supply (M1) without interest rate management, and inflationary pressure from exchange rate pass-through effect.

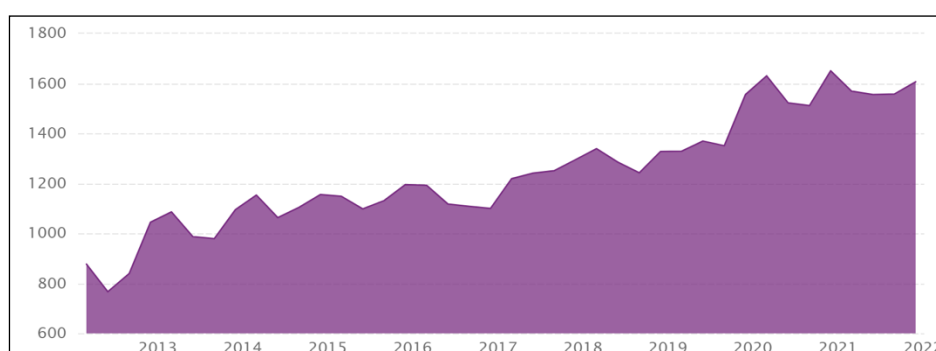


Figure 1: M1 Expansion in Laos 2013 - 2022

Source: <https://www.ceicdata.com/en/indicator/laos/money-supply-m1>

The devaluation of LAK was further compounded by Exchange-rate pass-through (ERPT). ERPT is the elasticity of local-currency import prices with respect to the local-currency price of foreign currency. It is often measured as the percentage change, in the local currency, of import prices resulting from a one percent change in the exchange rate between the exporting and importing countries (Goldberg and Knetter, 1997). A change in import prices affects retail and consumer prices. When exchange-rate pass-through is greater, there is more transmission of inflation between countries (Campa and Goldberg, 2005). ERPT may differ from firm to firm in the same country. Studies of firm-level differences explain why exchange-rate pass-through is not equal to one (Berman, Martin and Mayer, 2012). Some studies suggest that increase globalization contributed to a decrease in exchange-rate pass-through (Cook, 2014). However, for countries depending on imports and have poor currency value management policies, ERPT remains a serious and vexing issue.

ERPT is a serious issue for Laos because the country depends on import of fuel, food and consumer goods. For instance, during the first week of 2020 the exchange rates were 8,882 LAK per US dollars and 30.23 Baht per US dollar. By the middle of May 2022, the two currencies were trading at 13,240 LAK per US dollar and 34.39 Baht per US dollars. The increase strength of the US dollars had devalued both LAK and THB. Laos depends on imports from Thailand for its consumer goods which directly impact the cost of living of the people. This devaluation of the LAK could be clearly appreciated when it is read with the change in the per capita GDP. In 2020, the per capita GDP expressed in current US dollar was 2,588.78 for 2020 and 2,757.81 in 2022 (IMF, 2021); the increase in two years was 169.03 or 6.53%. During this same period, the devaluation of LAK was -49.07% compared to Thailand's Baht which devalued only -13.39% for the same period. For every 1,000,000 Baht of imported good from Thailand in 2020, Laos would have to pay 1,490,000 Baht in 2022, assuming that these goods were produced with domestic inputs in Thailand and were not affected by THB/USD exchange rate. The increase in imported goods translates directly to the increase in the cost of living of people in Laos. The 6.53% gain in the per capita GDP growth from 2020 to 2022 has been wiped out by the extreme devaluation of LAK. This ERPT effect presents a serious economic hardship for the local people in Laos.

A good economy exists when the household sector are net savers and the corporate sector are net borrowers, with the government budget nearly balanced and net exports near zero (Koo, 2009, 2011). The devaluation of LAK does not create economic recession. Laos expects to gain at least 4.8% in GDP growth in 2022. However, the continuing LAK devaluation puts economic hardship on people as fuel prices rises. Since fuel is purchased in US dollars, as the local currency devalues, fuel price becomes more expensive from ERPT effect. Similar experience also occurred in food and consumer goods prices.

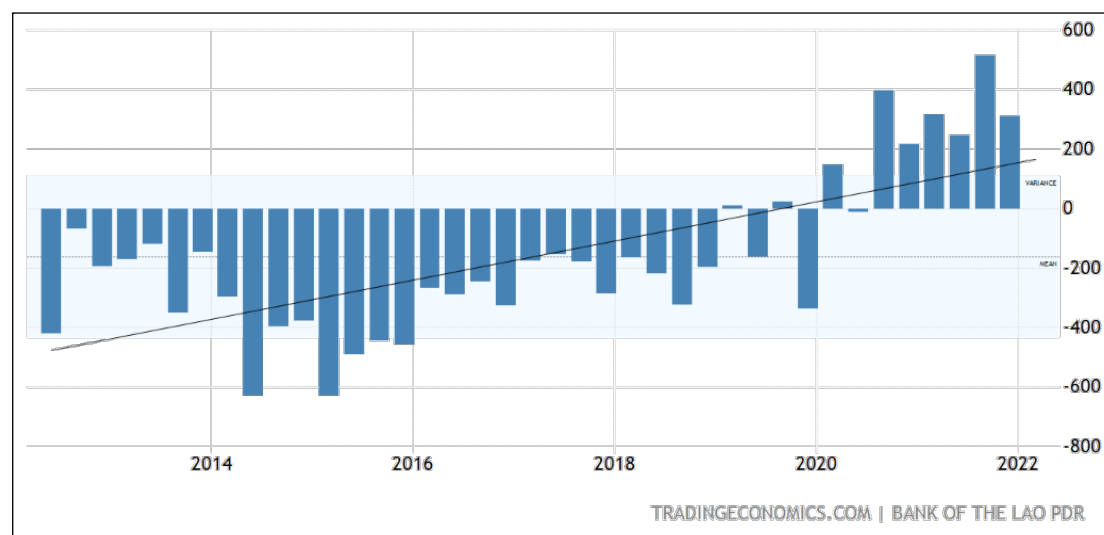


Figure 2: Laos balance of trade 2012-2022

Source: <https://tradingeconomics.com/laos/balance-of-trade>

Prior to 2020, the balance of trade for Laos was consistently negative. There were more imports than export. Since 2021, Laos began to have positive balance of trade. It exported 1,987.46 and imported 1,472.9 million USD or 35% more exports above imports. Between 2020 and 2021, the country's balance of trade gains decreased by 15%. This slowing down of the balance of trade is reflected by the devaluation of LAK by 56% from 8,600 LAK per USD to the current rate of 13,240 LAK per USD.

This is an interesting case study because LAK is one of the 10 currencies in the ASEAN and is one of the two market-led economies under communist governments, namely Laos and Vietnam. Presently, Laos uses US dollar, Thai baht, and Euro as common currencies in exchange for goods and services. Effective May 2022, the government keeps interest rate at 3.1% compared to 12.50% in 2010. This rate has been stable unchanged since 2020 despite the fact that Laos is dependent on import for fuel and consumer goods. In face recent announcement by the US Federal Reserve to increase interest rate for the second time in the second quarter of 2022 to stem the tide of inflation, the Bank of Laos (BOL) remained inactive and unresponsive to the threat of inflationary pressure and stronger US dollar. As the country continues to import fuel and food products, the price of fuel and food products became high in the local currency. Without a concomitant increase in wages, fuel and food products became more expensive by the second quarter of 2022. This paper attempts to answer the question of how can the Lao government effectively implement policy tools to reduce the effect of inflation resulted from exchange rate pass-through (ERPT), and what are currencies should BOL use for its basket of currencies to defend the value of LAK. This case study is first of its kind and can serve as a foundational material for further research on this subject. This paper has practical application for stakeholders of in currency market in Laos. Laos is a member of the ASEAN Economic Community (AEC), the impending economic depression brewing in Laos serves as a case study for stakeholders in other ASEAN countries. The effect of money supply policy and effective currency management practice are effective tools to defend a country's currency value.

Literature Review

Monetary discipline is monetary policy that limits the money supply of an economy (Melitz, 1987; Neyati and Ozgur, 2007; and Dalmazzo, 2014) by matching the money supply to the level of production in the economy or reserves. One key approach to monetary discipline is constraining money supply and effectively monitor the velocity of money in order to keep inflation under control. Another means to control money supply is by pegging the local currency to a foreign currency (Fielding and Bleaney, 2000). In the time of gold standard, currencies were pegged against gold price (Bordo et al., 2004). For example, the US dollar was defined as 0.048 troy ounce of gold (White, 2008). Central banks of many countries maintain gold reserves to defend the value of their currencies. Pegging is considered a fixed exchange rate. After 1970s, both float and fixed exchange rate systems were used (Kreinin, 2010). Currently, Laos is using fixed exchange rate.

There are three major sources of inflation: Demand-pull inflation, Cost-push inflation, and built-in inflations (Gordon, 1988). Firstly, demand-pull inflation is caused by increases in aggregate demand due to increased private and government spending. This type of inflation contributes to growth because increase demand stimulates economic expansion and growth. Secondly, cost-push inflation, also called "supply shock inflation," is caused by a drop in aggregate supply (potential output). This may be due to natural disasters, or increased prices of inputs. The current high oil prices coupled with LAK devaluation are prime condition to create cost-push inflation. Thirdly, built-in inflation is induced by adaptive expectations, and is often linked to the "price/wage spiral". Workers keep up with inflation by demanding higher wage. Manufacturers pass on the higher cost by increasing price of goods and services. Among these three types of inflation, Laos experiences demand-pull and cost-push inflations.

As LAK is devalued, increase oil prices and shortage of fuel in the local market, there are "too much money chasing too few goods" (Barth and Bennet, 1975) demand-pull inflation is created. Since Laos is import dependent on many goods, LAK devaluation contributed to significant increase in price of imports which are paid in US dollars and Thai Baht. The effect of inflation is more devastating when both demand-pull and cost-push are at work (Samuelson and Solow, 1960).

It has been argued that if economic growth matches the growth of the money supply, inflation should not occur when all else is equal (Sigrauski, 1961). However, this has not been the case in Laos. The economy is expected to grow at 4.8% in 2022; at the same time, the local currency has been devalued by 54% and money supply had grown excessively in the same period. Investment in market production, infrastructure, education, and preventive health care can all grow an economy (Henderson, 1999). This has been the case of Laos. There has been growth in infrastructure investment which had contributed to economic growth. At the same time, the expansion of money supply contributed to inflation at a rate higher than economic growth.

Exchange rate pass-through (ERPT)

Exchange rate pass-through (ERPT) is the degree to which a country's import, producer or consumer prices change in response to a change in its exchange rate. It is measured as the percentage change, in the local currency, of import prices resulting from a one percent change in the exchange rate between the exporting and importing countries. Countries with lower inflation environment will tend to experience lower ERPT (Taylor, 2000). Low inflation expectations produces credible monetary policy, the latter can play a role in shaping the ERPT

(Gagnon and Ihrig, 2004; McCarthy, 2007; Özyurt, 2016). Low ERPT may contribute to effective monetary policy to stabilize inflation and output (Mishkin 2008).

ERPT studies are confined to mainly in developed countries (Taylor, 2000; Gagnon and Ihrig, 2004; McCarthy, 2007; Özyurt, 2016). Developing economies saw less ERPT research (Choudhri and Hakura, 2006; Akofio-Sowah, 2009; Razafimahefa, 2012; Lariau et al., 2016; Helmy et al., 2018). Some studies saw weak and declining ERPT in both developed countries (Taylor, 2000; Özyurt, 2016) and developing countries (Razafimahefa, 2012; Lariau et al., 2016).

According to Gopinath and Rigobon (2008), ERPT regression equation is given by:

$$\Delta \ln p_t = \alpha + \sum_{i=0}^N \gamma_i \Delta \ln e_{t-i} + \delta \Delta \ln c_t + \psi \Delta \ln d_t + \varepsilon_t$$

where p is import price, e is the exchange rate, c is marginal costs, d is demand, and Δ denotes a first difference. The exchange-rate pass-through after N periods is

$$\sum_{i=0}^N \gamma_i.$$

In this study, we estimated ERPT for Laos and how it affects the valuation of that country's currency (LAK) through inflation.

Money supply, money multiplier and inflation

Money supply is defined as the stock of money in the economy which includes currency in circulation (i.e. physical cash) and demand deposits (depositors' easily accessed assets on the books of financial institutions) (Brunner, 2018). Formally, the stock of money is classified as M0, M1 and M2. M0 consists of central bank's Reserve Notes + paper money + Coins. Between M0 and M1, there is an intermediate class of money stock called MB: The total of all physical currency plus Federal Reserve Deposits (special deposits that only banks can have at the Fed). MB = Coins + US Notes + Federal Reserve Notes + Federal Reserve Deposits. M1 comprises of currency held by the public and demand deposits. M2 includes M1 plus M1, savings deposits and other relatively liquid assets such as small certificates of deposit and money market mutual funds. M3: M2 + all other CDs (large time deposits, institutional money market mutual fund balances), deposits of euro-dollars and repurchase agreements. M4: M3 + Commercial Paper + T-Bills). The stock of money: M0, M1, M2, M3 and M4 collectively are called narrow money.

The money supply is linked to inflation by the equation of exchange: $M \times V = P \times Q$ where M is the total dollars in the nation's money supply, V is the number of times per year each dollar is spent (velocity of money), P is the average price of all the goods and services sold during the year, and Q is the quantity of assets, goods and services sold during the year.

The percentage changes as per unit of time in the monetary exchange equation are given by: $\% \Delta P + \% \Delta Q = \% \Delta M + \% \Delta V$. By rearranging the equation, basic inflation identity is obtained: $\% \Delta P = \% \Delta M + \% \Delta V - \% \Delta Q$. Inflation ($\% \Delta P$) is equal to the rate of money growth ($\% \Delta M$), plus the change in velocity ($\% \Delta V$), minus the rate of output growth ($\% \Delta Q$).

In the present case, the money supply of LAK increases from 28.8414 million USD in 2019 to the high of 1.651 billion USD in 2020. The volume of M1 in Laos continues to expand through 2022. This paper asserts that this expansion of monetary supply contributed to the rapid devaluation of LAK. The rapid devaluation may also be explained by the money multiplier effect.

Money multiplier is the ratio of commercial bank money to central bank money (monetary base) under a fractional-reserve banking system. This multiplier is the reciprocal of the reserve ratio minus one, and it is an economic multiplier. The money multiplier is determined by: $m = 1 / RR$,

“By increasing the volume of their government securities and loans and by lowering Member Bank legal reserve requirements, the Reserve Banks can encourage an increase in the supply of money and bank deposits. They can encourage but, without taking drastic action, they cannot compel. For in the middle of a deep depression just when we want Reserve policy to be most effective, the Member Banks are likely to be timid about buying new investments or making loans. If the Reserve authorities buy government bonds in the open market and thereby swell bank reserves, the banks will not put these funds to work but will simply hold reserves. Result: no 5 for 1, “no nothing,” simply a substitution on the bank’s balance sheet of idle cash for old government bonds.” — (Samuelson 1948, pp. 353–354).

Laos allows reserve requirement to be in local and foreign currencies. The current reserve requirement for both foreign and local currencies is 5%. The money multiplier for Laos is $1/0.05 = 20$. This means that at a given level of money supply, the broad money in circulation is as high as 20 times that level.

Data and Methodology

The data used in this research consists of the weekly average of the spot rate for the exchange rate of the following currencies against the US dollar: CNY = Chinese yuan, EUR = euro, JPY = Japanese yen, LAK = Lao kip SGD = Singapore dollar, and VND = Vietnamese dong. The average weekly spot rates from January 1, 2012 to May 22, 2022. The sample size included 543 weeks of Asian currencies against US dollars.

Extreme value analysis

We explored extreme value theory as a possible theoretical framework to explain the devaluation of currency in extreme cases. “Extreme Value Distribution usually refers to the distribution of the minimum of a large number of unbounded random observations” (NIST, 2013). A threshold value is used for removing the minimum or maximum values. In the present case, we set the significance level at 95%; within the bound of 542 weeks of weekly exchange rate, we separate items showing $Z > 1.65$ as extreme devaluation of the currency. We examine this group of data whose probability distribution exceeds the threshold under the tail index. The tail index can provide information about the underlying distribution (Kostov & McErlean, 2002, p. 5).

There are two approaches to extreme value analysis. The first method uses the maxima block of points. This is called annual maxima series (AMS) approach (Hosking et al., 1985, and Madsen et al., 1997). The second method uses a specified points as the threshold beyond which points of values are considered extreme (Leadbetter, 1991). This is known as Peak Over Threshold (POT) approach.

Under PDS, the data set is assumed to take a particular distribution (Madsen et al., 1997). The question of “which distribution should PDS assume” remains unsettled. For instance, Shane and Lynn (1964) assume that PDS is Poisson distributed. Zelenhasic (1970) proposed that the exceedance is gamma distributed. Another group of writers, such as Miquel (1984) and Ekanayake and Cruise (1993), proposed that the exceedance is Weibull distributed. In Rosbjerg et al. (1991), it was suggested that lognormal distribution characterizes the exceedance. Lastly, there are researchers who suggests that the exceedance set is distributed generalized Pareto (Van Monfort and Witter, 1986; Hosking and Wallis, 1987; Fitzgerald, 1989; Davidson and Smith, 1990; Wang, 1991; Rosbjerg et al., 1992; and Madsen et al., 1995). This paper assumes that the data has characterized by Weibull distribution because the currency devaluation is a loss in valued from an expected norm akin to a failure trend analyzed by Weibull. After the extreme value are separated from the rest of the data set, they were analyzed under EVT. Currency devaluation is a cause for concern because extreme devaluation may lead to hardship among people, especially in countries that are dependent. Thus, EVT becomes is relevant in risk management (Embrechts et al., 1999, p. 32).

Rosbjerg and Madsen (1992) recommended that the threshold level (q_0) should be obtained by the sum of the expected mean plus the product of the k count and the sample's standard deviation, thus: $q_0 = E[Q] + kS[Q]$ where $E[Q]$ = observed mean of the sample; $S[Q]$ = sample standard deviation; and k = predefined frequency factor. This method of identifying exceedance level q_0 has been used in flood studies (Rasmussen & Rosbjerg, 1991) and precipitation research (Madsen et al., 1994). There is a limitation in this approach when the data is set is small. In order to make this study be generally applicable in other cases, we opt for the use of standard score equation as the tool for separating extreme points.

The series $X_i : (x_1, x_2, \dots, x_{543})$ for 543 trading weeks called sample $F(X)$ was subjected to standard score equation under 0.95 confidence interval: $Z(0.95)$ where $f(x) > 1.65$. Weekly exchange rates that exceed 1.65 or less than -1.65 are separated into a group called $G(X)$. The elements of $G(X)$ are used to calculate the tail index. For small sample size as in $X_i : (1, 2, 3, 4, 10)$, once extreme points are identified, the entire set is used for the tail index calculation, i.e. $F(X) = G(X)$.

In this study, we obtained the weekly average spot rates for the following currencies traded against the US dollar: CNY = Chinese yuan, EUR = euro, JPY = Japanese yen, LAK = Lao kip, SGD = Singapore dollar, THB = Thai baht and VND = Vietnamese dong. LAK is the target currency for evaluation of extreme devaluation. We have used the standard equation to test for extreme value by using $Z = 1.65$ as the threshold level beyond which the data is separated as extreme. All currency, except LAK, show exceedance group. The first 510 weeks of LAK were trading within the 95% confidence interval. From week 511 to week 543, LAK shows $Z > 1.65$. This exceedance group ($G(X)$) was used for further analysis under EVT.

Extreme values may be analyzed under the generalized extreme value (GEV) distribution proposed by Fisher-Tippett-Gnedenko:

$$H(x; \mu, \sigma, \xi) = \exp \left\{ - \left[1 - \xi \left(\frac{x - \mu}{\sigma} \right)^{-1/\xi} \right] \right\} \quad (1)$$

where μ = location; σ = scale; and ξ = shape. If $\xi > 0$, H becomes a cumulative distribution function (CDF); if $\xi < 0$, it is valid for $x < \mu + \sigma/(-\xi)$; and if $\xi = 0$, H is undefined (Bensalah, 2000). However, if $\xi \rightarrow 0$, then the Fisher-Tippett-Gnedenko equation is reduced to:

$$H(x; \mu, \sigma, 0) = \exp \left[- \left(\frac{x - \mu}{\sigma} \right) \right] \quad (2)$$

This is known as Gumbel distribution. Note that the parameter ξ is the tail index of the distribution. The tail index may be used to classify the type of extreme value distribution. If $\xi = 0$, the H distribution is Gumbel distribution, also known as Type I where $x \in \mathfrak{R}$ and $\xi = 0$.

If $\xi > 0$, the H distribution is a Fréchet distribution or Type II. The Fréchet distribution is given by:

$$H(x; \mu, \sigma, \xi) = \exp \left\{ \begin{matrix} 0 \\ \exp \left\{ \left(\frac{x - \mu}{\sigma} \right) \right\}^{-a} \end{matrix} \right\} \quad (3)$$

If $x < \mu$ then $H(x; \mu, \sigma, \xi) = 0$; if $x > \mu$ then $H(x; \mu, \sigma, \xi) = \exp((x - \mu)/\sigma)^a$. In Fréchet distribution with sample size n and parameters: α and β (Abbas & Yincai, 2012). The maximum likelihood estimation of β is:

$$\hat{\beta}_{ML} = \left(\frac{n}{t} \right)^{1/a} \quad (4)$$

If $\xi < 0$, the H distribution is Weibull distribution or Type III. The Weibull distribution is given by:

$$H(x; \mu, \sigma, \xi) = \begin{cases} \exp \left\{ - \left(- \left(\frac{x - \mu}{\sigma} \right) \right)^a \right\} & \text{for } x < \mu \\ 1 & \text{for } x \geq \mu \end{cases} \quad (5)$$

Once the tail index is determined, the next step was to classify the type of extreme value distribution of the series through the use of the tail index. There are two methods for the tail index estimation: the Pickands method (Pickands, 1975), and the Hill method. (Wagner and Marsh, 2000). The Pickands method is given by:

$$\hat{\xi}_{k,m} = \frac{1}{m} \sum_{i=1}^k (\ln X_{n-i+1} - \ln X_{n-m}) \quad (6)$$

where m = number of observations whose tail is to be observed and k = sample size. Secondly, the Hill method is given by:

$$\hat{\xi}_{k,T} = \frac{1}{k} \sum_{i=1}^k (R_{i,T} - \ln R_{k,T}) \quad (7)$$

where $R = \sigma Z$; recall that σ is the estimated population standard deviation and Z is the standard score of the series. Both methods follow the same conditions in providing the decision rule for classifying the type of extreme value distribution: *Fréchet* = $\xi > 0$, *Weibull* = $\xi < 0$ and *Gumbel* = $\xi = 0$. In this paper, we opt for the Hill method for calculating the tail index for the extreme group of data.

Weibull analysis for system failure in foreign exchange rate regime

In this paper, we applied Weibull distribution for currency devaluation analysis. We define extreme and rapid devaluation of a currency as a system failure. Therefore, the application of Weibull distribution is an appropriate tool in this study. The use of Weibull in decline curves analysis is not uncommon (Lee, Se and Mallick, 2021). In Weibull distribution analysis, eta (η) is the shape parameter (Jiang, 2011). The interpretation of the shape parameter follows are provided in 3 scenarios: $\eta < 1$, $\eta = 1$, and $\eta > 1$.

A value of $\eta < 1$ indicates that the failure rate decreases over time which corresponds to Pareto distributions (Elizaar, 2017) rather than Weibull distributions). In currency devaluation, this is characterized by extreme and rapid loss of currency value which may be due to internal policy of the government. The tendency is for the devaluation to move to a stabilized platform where $\eta = 1$. A value of $\eta = 1$ indicates that the failure rate is constant over time. This might suggest random external events are causing the devaluation of the currency. At this point, the devaluation is stabilized.

A value of $\eta > 1$ indicated the failure rate increases with time. This means that the devaluation of the currency causes the loss in currency value with increase in time. This is spiral devaluation. In some cases, countries would abandon their own currencies and adopt other countries' currency as substitute, i.e. Eswatini (alongside Swazi lilangeni); Lesotho (alongside Lesotho loti); Namibia (alongside Namibian dollar); and Zimbabwe (alongside the United States dollar, euro, Chinese Yuan and Botswana pula).

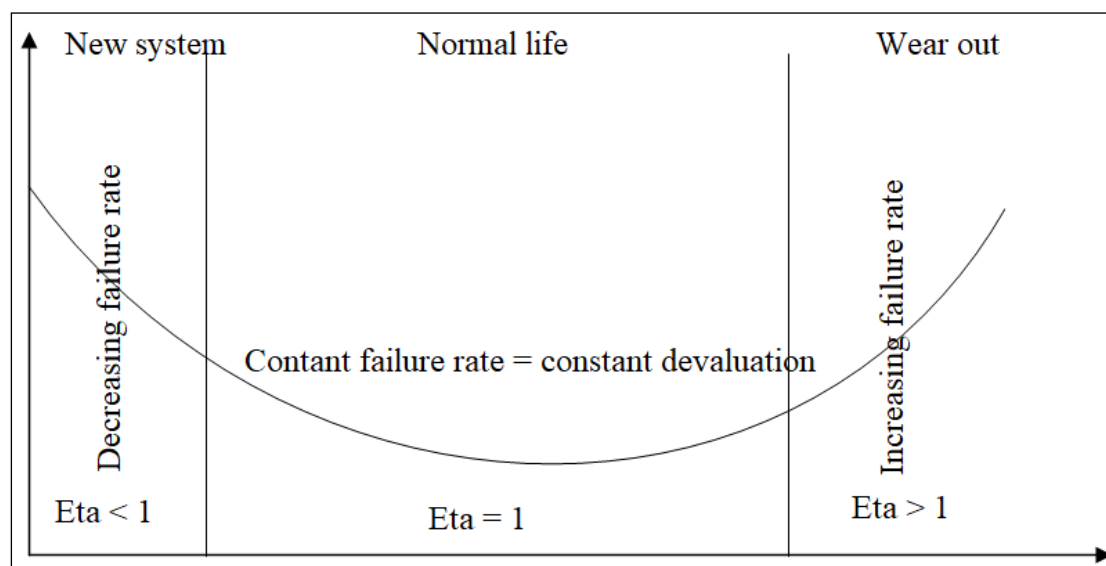


Figure 3: Behavior of Weibull system failure

Results and Analysis

We presented our findings and discussion in three sections. Firstly, we presented the characteristics of the seven currencies exchanges against USD by looking at the descriptive and inferential statistics. The inferential statistics tells us about the expected exchange rate that should be at the end of the period of our study on May 22, 2022. Both the descriptive and inferential statistics of the exchanges rate provided us with reference points for the movement of the seven currencies against the US dollar. Secondly, we present out findings on the model selection. We examine autoregressive model (AR) and Weibull system analysis of failure rate. We acknowledged that AR is a common toll for time series data analysis. Exchange rate over time is a time series data set; however, when dealing with steady devaluation after a long period of stability, AR may not be appropriate. In this case study, LAK had been stabilized for the past nine years. However, on its tenth year in 2022, we witness extreme devaluation. This extreme divergence from the long-term equilibrium made AR modeling in appropriate. Therefore, we adopted Weibull distribution as a tool to model the devaluation of LAK and the rest of the currencies in the basket for our study. Lastly, we noted that the last 33 weeks ending May 22, 2022 LAK had experience extreme devaluation. Under these circumstances, we employed Extreme Value Theory (EVT) as a tool to study the behavior or LAK. We found that currencies showing positive tail index indicated extremely strong and negative tail index indicated extremely weak currencies.

Characteristics of selected currencies

The series of the data extends 543 weeks (January 1, 2012 to May 22, 2022). We can summarized the trajectory of the exchange rate movement of these seven currencies under autoregressive (AR) model and Weibull time series to show the predictive function for exchange rates movement. The descriptive and inferential statistics of these currencies over a period of 543 weeks are summarized in table 2. We note that the sample mean and expected mean of LAK were 8,556.79 and 8,496.35 respectively. These figures may be compared to the last spot rate on May 22, 2022 at 13,240 LAK per US dollar which represents a devaluation of 54%.

Table 1: Basket of currencies under analysis as weekly rate against USD ($n = 543$)

Selected Currencies*	Descriptive Statistics		Inferential Statistics	
	Mean	STD	μ	δ
CNY	6.51	0.30	6.49	0.30
EUR	1.19	0.09	1.18	0.09
JPY	106.70	11.07	105.92	11.07
LAK	8,556.79	853.55	8,496.35	853.55
SGD	1.34	0.06	1.33	0.06
THB	32.48	1.70	32.36	1.70
VND	22,275.43	895.14	22,212.05	895.14

*CNY = Chinese yuan, EUR = euro, JPY = Japanese yen, LAK = Lao kip, SGD = Singapore dollar, THB = Thai baht and VND = Vietnamese dong.

Model selection and predictive functions of currency movement

In this case study we are faced with the issue of model selection. Model selection problem is selecting a few representative models from a large set of computational models for the purpose of decision making or optimization under uncertainty (Shirangi and Durlofsky, 2016). There are two goals of model selection: model selection for inference and model selection for prediction (Ding, Tarok and Yang, 2018). We are faced with the choice between autoregressive (AR) modeling for time series data. This approach is not an effective tool for making inference or prediction when the data does not return to its long-term equilibrium. AR is more appropriate for a stable system of data. Currency devaluation in extreme cases where the devaluation spirals downward and showing no sign of returning to its long-term equilibrium, AR is not an appropriate model. AR is more appropriate for a stable system and to analyze the effect of external shock. In this case, study we are faced with a system failure that requires a different approach to system analysis. As such, we opted for Weibull distribution as a tool to analyze the devaluation of LAK by defining the devaluation as a system failure. Secondly, Weibull distribution is used for specific period of devaluation that is considered extreme. Thus, this case study also applied extreme value theory (EVT) as a tool to analyze the extreme currency devaluation. We illustrate the efficacy of AR and Weibull in Table 2.

Table 2: Predictive function of time series for six currencies under autoregressive (AR) and Weibull models

Selected Currencies	Autoregressive (AR(1)) Model	Weibull system analysis Model
CNY	$Y = 6.72 + 0.02X$	$Y = 1.58 + 0.02X$
EUR	$Y = 0.94 - 0.001X$	$Y = -0.20 + 0.03X$
JPY	$Y = 129.70 + 0.47X$	$Y = -3.76 + 4.82X$
LAK	$Y = 13,765.93 + 304.08X$	$Y = 8.92 + 0.11X$
SGD	$Y = 1.38 - 0.0005X$	$Y = 0.27 + 0.02X$
THB	$Y = 34.37 + 0.03X$	$Y = 3.47 + 0.01X$
VND	$Y = 23,207.35 + 43.99X$	$Y = 9.95 + 0.05X$

AR model is an effective tool to estimate the long run expected value, i.e. mean. However, if we are looking for indication of significant devaluation, the long run equilibrium point under AR may not be appropriate. Current devaluation process in a steady decreasing process, such that witnessed by LAK in this study, is not meaning unless a block of data defined by time period and sifting by a fixed threshold ($F(Z) > 1.65$) and analyze separately under EVT. Thus, for extreme value analysis of currency devaluation, we opt for Weibull and EVT. Weibull has long been applied in social science for failure analysis. Extreme currency devaluation represents a fail pattern of exchange rate regime and policy of a country.

We note that AR model is not an efficient model for this study because by using the previous exchange rate as the explanatory factor for the current exchange rate, the system tends to show high stability. Even when there is a shock to the system, the self-corrective return to the long-term equilibrium may integrate the effect of shock into the system. In currency devaluation, we note that the trajectory of the falling of currency value is not linear. This falling of currency is akin to survivorship model which could be more appropriately studied under Weibull system analysis. Under the Weibull model, we can predict the shape and scale of the exchange rates distribution and, thus, can learn more of how the currencies behavior. Table 3 below summarizes the Weibull statistics for the seven currencies.

Table 3: Weibull distribution analysis of currency exchange rates, $n = 543$

Selected Currencies	Beta (β)	Eta (η)	CDF* (Φ)	PDF (ϕ)	R (<i>Reliability</i>)	Instant Fail ($H(t)$)
CNY	0.52	0.42	1.00	0.18	-	0.84
EUR	4.55	2.21	0.19	0.13	0.81	0.13
JPY	0.21	0.03	1.00	0.05	-	0.46
LAK	0.11	-	1.00	0.02	-	0.26
SGD	3.65	2.01	0.20	0.24	0.80	0.26
THB	0.28	0.08	1.00	0.08	-	0.57
VND	0.10	-	1.00	0.02	-	0.24

*Predictive value used in calculating Weibull statistics is the observed mean.

The interpretation of Weibull statistics tells us that if beta is less than 1, the system tends to fail at the start. If beta is equal to 1, the failure rate is constant, and if beta is greater than 1, the failure rate increases with respect with time. In the present case, we expect to see continue devaluation of CNY, JPY, LAK, THB and VND. For China, weak CNY does not present a problem because China is export oriented economy.

With eta (η) at 0.11, we are witnessing LAK to go through its decreasing failure rate. If LAK devaluation behaves as predicted by Weibull's probability distribution pattern, we expect LAK to continue to devalue passing through a period of eta = 1 and then finally, if no intervention is made, reaching a complete failure when eta > 1. The prime time for intervention is a period where eta \leq 1, which is now.

Currency devaluation analysis under extreme value theory (EVT)

In the 543 weeks of the data, we found that the exchange rate of LAK against USD was stable from January 1, 2012 to September 25, 2021. The currency starts to experience significant devaluation from October 3, 2021 onward. Significant devaluation was verified by the significance level of the rate dispersion among the entire sample of 543 weeks. From the first week (January 1, 2012) to the 510th week, the pValue of the exchange rate per week was greater than 0.05. The descriptive and inferential statistics for the normal period (week 1 to week 510) is given in Table 4.

Table 4: Descriptive and inferential statistics of non-extreme group weeks 1 – 510

<i>Group 1: n = 509</i>	Descriptive statistics	Inferential statistics
Mean	8,376.19	8,342.20
Standard deviation	467.56	0.3204
Skewness	1.03	-
Kurtosis	0.10	-
<i>Group 2: k = 33</i>	Descriptive statistics	Inferential statistics
Mean	11,295.77	11,196.86
Standard deviation	346.46	0.8098
Skewness	0.50	-
Kurtosis	0.64	-

The devaluation of LAK becomes statistically significant since October 2021. Although there is a sign of spiraling effect of the devaluation, it is still in an early stage for government intervention. In the second quarter of 2022, the US, UK, and Canada announced that their central banks will increase interest rate in response to inflation. This interest rate increase will make US dollar stronger. As the result LAK will further devalue because the Bank of Laos does not keep up with the US interest hike. So long as BOL remains in active in its interest rate policy, we expect to see further decline of LAK value as it is traded against the US dollar. This problem is more prominent because US dollar is openly used and traded in the country.

After week 510th the rate of LAK against USD shows pValue of less than 0.05. As the result, week 1 to week 510 were separated and treated as normal exchange rate data set. A period from week 511 to week 543 was treated as extreme value set. Table 6 below shows the Weibull statistics of the extreme value set.

Table 5: Weibull statistics for weeks 510-543 of LAK exchange rate against USD

$n = 33$	Value	Interpretation
Weibull linear equation	$Y = 9.36 + 0.05X$	Devaluation is systemic
Beta (β)	19.35	Continuing devaluation
Eta (η)	11,622.62	Expected LAK per USD
Weibull CDF	1.00	Cumulative probability
Weibull PDF	0.02	Probability distribution
R system reliability	0.00	System reliability
H(t) instantaneous failure	0.26 or 0.26%	Devaluation survivorship

The Weibull linear equation for LAN is $Y = 9.36 + 0.05X$. Since the intercept is in log form, when converted to its original value, the long-term average value for LAK is $\exp(9.36) = 11,622.62$ per one USD. However, the average spot rate for May 22, 2022 (week 543rd) was 13,240.00 with a difference of 1,617.38 or 14% under the expected value. This 14% below expected value of LAK is an inflationary pressure against LAK through exchange rate.

We examined all currency in the basket for this study and found that CNY, THB and VND had no extreme values for either over-valued or under-valued. These countries (China, Thailand, and Vietnam) have effective currency management practice. Their currencies have been stable for the past 10 years or 543 weeks from 2010 to May 2022. We found that two currencies (EUR and SGD) had been overvalued in part of 2014 for EUR and 2013 for SGD.

From the data between weeks 511 to week 543, LAK had show statistically significant devaluation with EVT's tail index of 5.60 and with a beta of 0.11 (less than 1) the devaluation is likely to continue. Since this extreme devaluation had been going on for 33 weeks, it is a prime time for the central bank to defend further valuation of LAK. The devaluation of LAK in an extreme condition is indicated by a large tail index in under EVT analysis ($\xi = 5.60$). As referenced, when the tail index is greater than zero, the distribution is classified as Fréchet distribution. ($\xi > 0$). The result of the tail index calculation and classification of distribution according to the tail index is given in Table 6.

Table 6: Exchange rates analyzed under Extreme Value Theory (EVT)

Selected Currencies	K Extreme	Period	ξ Tail Index*	Distribution Type
CNY	34	Aug'19-May-20	2.69	Frechet
EUR	48	Sep'13 – Aug'14	4.48	Frechet
JPY	53	Jan – Dec 2012	0.16	Frechet
LAK	33	Jan – May 2022	(1,628.30)	Weibull
SGD	26	Sep'12 – Feb'13	4.28	Frechet
THB	N/A	No extreme	No extreme	No extreme
VND	N/A	No extreme	No extreme	No extreme

*: *Fréchet* = $\xi > 0$, *Weibull* = $\xi < 0$ and *Gumbel* = $\xi = 0$.

Under Fréchet distribution, three parameters are examined: (i) Shape parameter which is defined as $\alpha = -1/\xi$; (ii) Scale parameter which is determined by $\beta = \sigma/\xi$; and (iii) Location parameter which is given by $\tau = \mu + (\sigma/\xi)$. Under these definition, the shape parameter for LAK is $\alpha = -0.0006$; scale $\beta = -0.54$; and location $\tau = 11,216.32$. Under this prediction, the expected exchange rate for LAK should be 11,226.27 LAK per US dollar. However, the last spot rate traded on week 543 (May 15, 2022) was 13,240----- under shoot by 2,013.73 or 15%. In comparison to our original Weibull estimate at 14%, the estimate of LAK under EVT is 1% down in value.

A lower value for the home currency will raise the price for imports while making exports cheaper (Owen, 2005). However, for import dependent economy, weak currency or currency devaluation could be devastating for the local market because the price of imports becomes more expensive (Cooper, 1971). According to Krishner, a strong currency was commonly seen as a mark of prestige, while devaluation was associated with weak governments (Krishner, 2002). With the on-going long lines at gas station and increased cost of living, the devaluation of LAK inflict hardship on local people.

A reason for preferring devaluation common among emerging economies is that maintaining a relatively low exchange rate helps them build up foreign exchange reserves, which can protect against future financial crises (Sloman 2004; Wolf 2009; and Owen 2005). However, the devaluation of LAK did help BOL to shore up its foreign reserve. Immediately after COVID-19, BOL's foreign exchange reserved stood at about 800 million USD; this figure increased to almost 1.4 billion USD in 2021---at the height of LAK devaluation

(CEIDATA, 2022). A rule usually followed by central banks is to hold in reserve at least three months of imports. However, currently, BOL's foreign exchange reserves could afford the country for only two months.

BOL is caught in a bind. In order to meet the bar set by Basel III of 3 months worth of foreign exchange currency reserves, it must increase its reserves. Foreign exchange reserves expansion causes the local currency to devalue. As BOL expands its foreign currency reserves, LAK continues to devalue. This problem is further compounded by the fact that the current conflict between Russia and Ukraine and the simultaneous increase of oil price in the world market makes the price of food and fuel even more expensive throughout the world. As an import dependent economy, Laos stands to see more devaluation of LAK throughout this fiscal year.

The prospect of continue devaluation of LAK is predicated upon the value of η in the Weibull statistics. According to the rule of interpretation of Weibull, $\eta < 1$ indicates that the failure rate decreases over time and will stabilize where $\eta = 1$. Presently, LAK's devaluation has $\eta = 0.11$. It will most likely approach 1 and then greater than 1 according to the Weibull η 's trajectory. If that is the case, the devaluation is still at its early stage where intervention is possible. As we have shown in the data plotting of extreme values, the last 33 weeks ending May 15, 2022, the devaluation of LAK became significantly high and is treated as extreme. With the tail index of 5.60 between January and May 2022, LAK had been extremely weakened. The current weakening of LAK translated into economic hardship of people as the local economy depends on fuel imports. In order to import fuel, LAK must be exchanged for US dollar. This means that BOL must shore up its foreign currency reserve. As the central bank increases its foreign currency reserve to meet foreign currency exchange needs, LAK is further devalued.

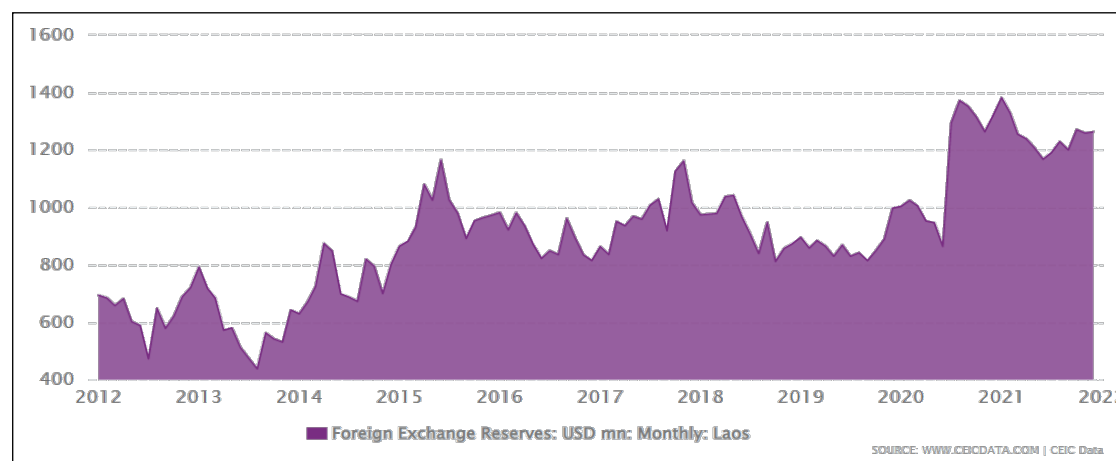


Figure 4: Foreign exchange reserve of Laos

Source: <https://www.ceicdata.com/en/indicator/laos/foreign-exchange-reserves>

Conclusion

In this case study, we learned that increasing foreign exchange reserved couple with devaluation of the country's currency will result in currency devaluation. The devaluation of LAK in the second quarter of 2022 has caused traumatic consequences in the local market creating long lines at gas station and increasing cost of living. The devaluation created inflationary pressure on the local market through the ERPT effect. The effect of ERPT detracts the impetus of growth from the economy. The GDP of Laos was expected to grow by 4.8% in 2022; the country's currency devalued by 49% in the same year. The Lao economy is at the verge of slipping into recession. In order to solve the continuing devaluation of LAK, the Central Bank of Laos must intervene by pegging its interest rate with the US. By stabilizing interest rate at 3% in Laos while the US had increased its interest rate in the first two quarters of 2022, LAK is losing its value against the US dollar. Part of the devaluation comes from expansive money supply policy. With an increase in interest rate, M1 should contract and the devaluation of LAK could be hemmed.

Recommendations

The government should maintain an effect policy mix. The policy mix is the combination of a monetary policy and fiscal policy. These policies are used to stimulate growth and employment (Reynolds, 2002). In face if extreme devaluation of LAK, the government should engage in contractionary monetary policy in order to fight inflation, ensure price stability, and increase the strength of LAK (Levy and Sturzenegger, 2010). Contrationary money policy tools may include:

1. Increase reserve requirement (RR)

Presently, the RR rate is 5% making the money multiplier effect of $1/0.05 = 20$ times. It is recommended that RR be increase to 10 or 15% to slow down the money multiplier effect and stem the tide of LAK devaluation.

2. Foreign exchange reserve control

Decrease foreign exchange reserve to shore up LAK devaluation. The increase of foreign exchange reserve has the effect of devaluing the local currency because the local currency is exchanged for US dollar.

3. Basket of currencies

LAK must be peg against the US dollar. This pegging practice would imply that BOL must peg its interest rate with the US Federal reserve. In addition, other currencies that correlate with LAK under USD exchange regime include: SGD, CNY, VND and EURO, together these currencies produced R-squared of 0.52 of the exchange rate against USD and each has significant relationship with LAK against USD at $p = 0.000$.

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The Components of Yoga Destination Development: A Thailand Case Study

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Abstract

This article emphasis on study about the components of yoga destination development: A Thailand case study which has objective are 1) to study core resources components of yoga destination development 2) to study supporting resources components of yoga destination development. The qualitative research methodology was used for this study. In addition, the qualitative data were collected by semi-structure interview from 20 relevant yoga developing stakeholders which were public sectors, yoga entrepreneurs and yoga instructors, analyzed by content analysis.

The results reveled that, firstly, core resources components of yoga as led to efficiency destination development were; the readiness of space and equipment, the surrounding attractions, the famous of yoga destination, the safety, the expertise of yoga instructors, the service quality, the authenticity of yoga, the well-being activities and a variety type of yoga. Secondary, supporting resources components of yoga as led to efficiency destination development were; the accessibility, the facilities and amenities, accommodation, a variety of tourist attraction, the local infrastructures and the promoting policy of yoga destination.

Finding of this study could be analyzed and transformed to be guidelines the efficiency of yoga tourism development. Composed of components of the development of yoga tourism destinations in the core resources which is divided into 3 aspects: 1) the development of yoga studio 2) the development and enhancement of yoga tourism personnel and 3) the development and promotion of traditional characteristics of yoga and components of the development of yoga tourism destinations in terms of supporting resources.

Keywords: Types of yoga, Yoga destination development, Core resources components, Supporting resources component

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Introduction

It has becoming more attractive among wellness enthusiasts who seek to enhance their overall well-being. The phenomenon of yoga has been practiced for therapeutic purpose in India for thousands of years (Iyengar, 1989). Additionally, it could also serve as a target market for tourism. Until to roughly a decade ago, yoga was regarded as a type of tourism. (Öznlbant & Alvarez, 2019).

Many scholars have defined yoga tourism term in various meanings. It can be concluded that Yoga Tourism is organized into different forms of tourism. (Aggarwal et al., 2008 ; Lehto et al., 2006 ; Liberman, 2004 ; Maddox, 2015 ; Nichter, 2013 ; Sharpley & Sundaram, 2005) Under Special Interest Tourism, Yoga Tourism is categorized as Wellness Tourism. (Ali- Knight & Ensor ,2017; Smith & Puczkó, 2009) . The journey to the yoga destination for deep practicing and related wellness activities that will enhance the physical, mental, and spiritual balance of yoga tourists. In other words, yoga tourists are special interests whose motivation and decision-making are primarily determined by their interest in yoga (Ali-Knight, 2009). However, Others argue that it is also a type of spiritual and cultural tourism. (Connell, 2006; Gerritsma, 2009; Koncul, 2012; Smith & Kelly, 2006; Smith & Puczkó, 2009). On the other hand, yoga tourism is regarded as a form of alternative tourism. As an alternate for tourists who really seek to practice extremely developed abilities that are different from other forms of tourism (Konu, 2010 ; Lehto et al., 2006) , it avoids negative impacts and sufficient nutrient impacts on society, culture, and the environment. This is particularly the case in a setting such as a beach resort or one surrounded by amazing scenery with pleasant climate (Lehto et al., 2006).

Yoga Tourism is one of the key economic drivers in many countries throughout the world, growth can be attributed to its economic impact (Kayar & Kozak, 2010) . The yoga destination's characteristics in different regions need to be developed to fulfill the needs of yoga tourists and to attract yoga tourists whose behaviors and needs change over time. Similarly, people involved with the development of yoga tourism locations must be able to deal with key resource limitations. The competitiveness of the providers is directly influenced by the performance of the destination tourism development stakeholders in the global market and the constant transformation of the market (Enright & Newton, 2004). Furthermore, the rapid growth of the yoga tourism industry, the destination tourism industry has a larger market share and increased competition in the yoga tourism industry as well as the level of competitiveness has become. It's important to measure the performance of a destination compared to competitors (Croes & Kubickova, 2013; Dwyer et al., 2016).

An important indicator measures a yoga destination's readiness as a method for identifying components that are critical to a tourist's experience and decision-making. It has been stated that the potential of any yoga destination will be determined by the development and evaluation. Additionally, it depends on the tourism resources accumulated in each attraction (based on Resource Endowments), which includes natural resources, historical and cultural resources and tourists expect facilities and infrastructure to be readiness and capable of satisfying tourists, and resource deployment leads to result, the yoga tourism industry's growth and development has contributed to the competitive advantage (Dwyer and Kim, 2003; Ritchie & Crouch, 2010).

Developing and planning strategies for continuous improvement in quality and development progression. It encourages the expansion and growth of the yoga tourism industry,

as well as the creation of an impressive image for tourists visiting yoga destinations, along with satisfaction with the changes that have occurred since their last visit to that destination. It is a magnet for tourists to revisit to travel because of the growth of yoga tourist attractions to have greater service and tourism potential concerned of sustainability (Buhalis, 2000; Hassan, 2000)

When the Covid-19 pandemic occurred in the world, it was this phenomenon that changed the concept of BCG from an alternative to survival in turning the Thai tourism industry back to be the main industry that generates income for the country. Also, makes the Thai economy strong and sustainable again with the mechanism of this BCG concept (TAT Academy, 2016). it will be a part that can help tell stories that make tourists see the value of tourism products and services. Both the public and private sectors involved in the tourism industry must try to offer quality products and services. for tourists to have a good experience along with having to build on biodiversity and culture connected to the philosophy of sufficiency economy to make the BCG economic model in the tourism dimension more concrete (NSTDA, 2020).

However, stakeholders involved in the development of yoga tourism should consider strategies to drive and develop yoga tourism destinations with the BCG economy model to transform the economic and social development. Hence, promoting and development of yoga destination to be the high-value services, based on the country's biodiversity and cultural diversity. Adopting modern digital innovation technology that contributes to breaking down barriers to development, generating long-term economic growth, distributing income, opportunity, and security to all yoga tourists, and maintaining a balanced resource base and biodiversity.

According to a previous literature review, many nations are still developing academically and practically. Particularly, it was observed that while some research had been deeply committed to the idea, style, and relevance of yoga tourism as well as spiritual retreat, there had been relatively few studies on yoga in the context of destination tourist strategy and management. (Ali-Knight & Ensor, 2017; Lehto et al., 2006; McCartney, 2020; Öznalbant & Alvarez, 2019; Sharma & Kumar Nayak, 2019). Academics all over the world, especially in Nepal, India, and Thailand, have recently started to place a greater emphasis on it. (Cheer et al., 2017; Maddox, 2015; Sharma, 2020). As a result, little research has been carried on wellness tourists who travel to practice yoga. To bridge that gap, this study uses Hua-Hin, Thailand, as a case study and focuses on guiding principles for the growth of yoga tourism in Thailand. In order to respond to the yoga principle, increase experience with current changing trends in tourism, develop destination image, add value, and learn/manage an acceptable approach to boost creative activity and experience for yoga destinations, it is crucial to understand the stakeholder perspectives with regard to the two components of the yoga destination development. (Ashton, 2021; Bhumiwat & Ashton, 2020a, 2020b; Neupane, 2019)

Literature Review

The concept of Yoga Tourism

People seek healing and rehabilitation because of the tensions and pressures of modern life (Ali-Knight & Ensor, 2017), and yoga is regarded as a way of resolving lifestyle problems (Aggarwal et al., 2008; Sharma & Kumar Nayak, 2019). In recent years, yoga has gained popularity among wellness enthusiasts all over the world (Sharma & Nayak, 2018). Furthermore, it has transformed into a type of tourism that is developed by the combination of yoga and tourism and has become a component of building a balanced lifestyle for many

wellness enthusiasts throughout the world. This is referred to as yoga tourism. (Sharma & Kumar Nayak, 2019; Lehto et al., 2006).

Yoga tourism has been categorized into many types of tourism by numerous scholars in a variety of ways. Yoga tourism is a part of wellness and health tourism; it is traveling to yoga destination to engage in yoga and other wellness practices that balance one's physical and emotional well-being (Aggarwal et al., 2008 ; Lehto et al., 2006; Liberman, 2004 ; Maddox, 2015; Nichter, 2013; Sharpley & Sundaram, 2005). The emphasis on the harmony of the body, mind, and spirit in religious beliefs is also known as religious and spiritual tourism (Connell, 2006 ; Gerritsma, 2009 ; Koncul, 2012 ; Smith & Kelly, 2006 ; Smith & Puczkó, 2009). It can also be considered as an alternate form of tourism that minimizes negative impacts and encourages favorable social, cultural, and environmental impacts (Konu, 2010 ; Lehto et al., 2006). Perhaps yoga tourism falls under the category of special interest tourism, which targets a niche market designed to serve local residents' specific interests in order to encourage their distinctive interests and offer them distinctive experiences (Redekop, 1999). It can be classified as a new form of slow tourism that emphasizes leisurely travel and in-depth experience. Likewise, to this, yoga tourists enjoy their surroundings and take their time when traveling and practicing about yoga (Tiyce & Wilson, 2012). However, for the sake of this study, the researchers classified yoga tourism as a type of wellness tourism, when tourists visit to partake in yoga and other wellness-related activities in order to improve their overall sense of body, mind, and spirit balance.

The concept of Yoga Destination and Sustainable Development

The market share of yoga tourism has grown quickly, increasing rivalry, and it is now important to assess the competitiveness of a destination attraction in order to assess how effective it is in contrast to its rivals. As a result of rising competition, significant changes are taking place globally that affect the yoga tourist experience (Dwyer et al., 2016).

Development of a tourism destination refers to the strategic planning and improvement of a specific area to accommodate the changing needs of visitors to a destination that attracts tourists on a regular basis. Emphasis on the supply side of tourism leads in a favorable experience that can be distinguished by high-quality facilities and first-rate services to counterbalance customers (Destination British Columbia, 2020). The effectiveness of the destination is also considerably improved by tourism. The destination has to have better infrastructure and tourism amenities to become more competitive (Nagle, 1999). Furthermore, The success of a destination also depends on decisions on investment, hiring, and training. Moreover, tourism marketers and developers need to advertise their location to build a brand that appeals to and targets this tourist market (Laws, 1995).

However, Ritchie and Crouch (2010) and Dwyer and Kim (2003) models of destination competitiveness and sustainability have been utilized in this study. It serves as a valuable tool for identifying qualities that are essential to a tourist's success and decision-making, and it is a sign of how prepared a yoga destination is. Moreover, it was emphasized that the development and length of any tourist attraction will determine its potential, and that it must have tourism resources, including human, cultural, and economic resources, in order to be sustainable.

In order to develop a yoga destination, two components are important. Firstly, one of the key components of a destination's appeal is yoga destination development (YDD), particularly in terms of core resources. These are the main characteristics that influence tourists to visit a specific location, including geography and climate, culture and history, connections

to the market, a variety of activities, special events, and entertainment. Yoga lessons are provided for the transformative experience, which causes certain mental, emotional, and physical changes. Additionally, tourists who integrate yoga with other wellness activities to broaden their knowledge and maximize their time and money (Dillette, Douglas, & Andrzejewski, 2019). Secondly, yoga destination development (YDD) in terms of supporting elements serve as a foundation for the growth of a prosperous tourism industry. Although a destination may have an abundance of primary resources and tourist attractions, its tourism industry may nevertheless encounter considerable difficulties.

These elements include infrastructure; accessibility; facility; hospitality; enterprise and political will. Especially, the readiness of facilities will be more tourists' comfortable in their surroundings when facilities are ready. In order to meet their demands, tourists make use of a variety of supporting resources, including parking, gas stations, gift stores, shopping centers, and hospitals (Kartika Maharani, Supriadi & Wisnu Parta, 2020).

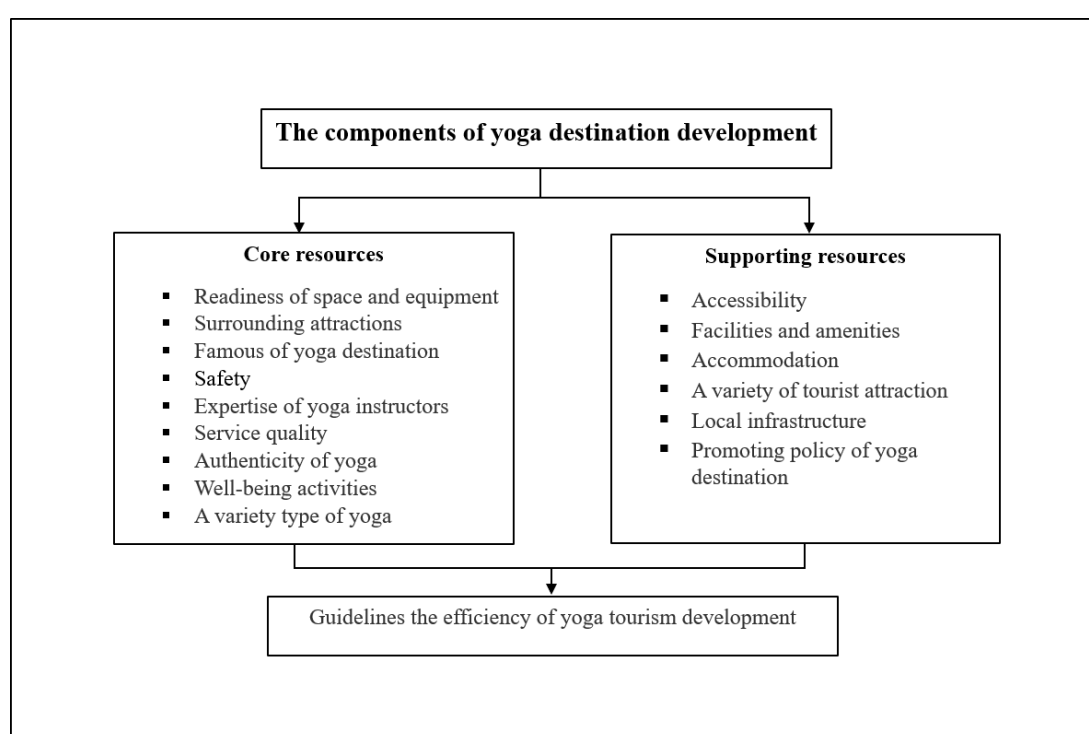


Figure 1: Research Framework for this study

Methodology

Data Collection

This study employed an in-depth interview for this study, which is a semi-structured interview that allows for in-depth information and is less time-consuming than interviewing with clearly specified questions (Mashuri, Sarib, Alhabsyi, Syam, and Ruslin, 2022). It allows interviewers to express their opinions and mutually clarify more specifics with no information constraints. It involved in the core and supporting resources components of yoga destination development.

This study has collected primary data which is the data that the researcher has collected newly for the purpose of research, especially stakeholders involved in the development of yoga destination in Hua-Hin District, Prachuap Khiri Khan Province in order to obtain in-depth information on the yoga destination development issue toward analyze and describe the content.

Data from the in-depth interviews was collected in 2021 between January and February. Additionally, a number of yoga Hua-Hin studios were contacted for interviews by first contacting their managers or owners and the presidents/committees of their respective yoga associations; once permission was obtained, the researcher started to interview from the target samples.

Data Analysis

This is qualitative research with data collected through a semi-structured interview. The researcher analyzed the data and conducted content analysis by categorizing it into relevant groups. After that, they were analyzed, synthesized, and interpreted. Following that, the data was collected and presented in a descriptive format, with questions covering the research objectives and scopes in each section (Kabir, 2016). The researcher categorized the intriguing groups. Next, data components were categorized in order to organize coding and correspond with the objectives. The findings will develop the yoga destination in Thailand as a consequence of the analysis of the results based on the literature review.

Study Area

The study focused on the in-depth interview on guidelines the efficiency of yoga tourism development for the yoga destination in Hua-Hin, Thailand from stakeholders' perspective relevant to develop yoga destination including the public sectors, yoga entrepreneurs, and yoga instructors. Most importantly, Hua-Hin was considered as the most suitable location because it is a relatively new Thai wellness destination in the Prachuap Khiri Khan region in the south, which is rapidly gaining popularity as a Bangkok alternative (Born Distinction, 2011). In addition, Hua-Hin has maintained a five-year plan for sustainable tourist arrivals during and after the Covid-19 pandemic. It was predicted to rebound faster than other tourist destinations in the country due to its strategic location and proximity to Bangkok. (C9 Hotelworks, 2020).

Participations of this study

The population target in this study was comprised of stakeholders involved in the development of yoga destination in Hua-Hin District, Prachuap Khiri Khan Province, including the public sectors, yoga entrepreneurs, and yoga instructors. The sample group was chosen by using non-probability sampling with purposive sampling method. For qualitative research, the number of the group to be interviewed should be between 20 and 30 people, or the interview should be extended until the same information is presented repeatedly. In this study, the sample group consists of 20 participants. Most of the participants were male (60%) and the remaining female (40%). It can be regarded to be essential for this study since they can provide in-depth information, especially when the results involved in the experience of yoga destination development.

Table 1:

No.	Gender	Age	Type	Position
1	Female	36	Public sector	Marketing officer and Head of Yoga Hua-Hin Festival - Tourism Authority of Thailand
2	Female	55	Public sector	Tourism and sports - Tourism and sports of Prachuap Khiri Khan Province
3	Male	38	Public sector	Project coordinator - Tourist Information Center of Hua-Hin
4	Male	35	Public sector	Project coordinator - Tourist Assistance Center of Hua-Hin
5	Male	54	Public sector	Deputy Mayor – Hua-Hin Municipality
6	Male	42	Yoga Entrepreneur	Shakti Yoga HuaHin
7	Female	50	Yoga Entrepreneur	Life Studio HuaHin
8	Female	44	Yoga Entrepreneur	Rachaya studio Hua-Hin
9	Female	51	Yoga Entrepreneur	Yoga & I
10	Female	45	Yoga Entrepreneur	Fit Station HuaHin
11	Male	42	Yoga Instructor	Shakti Yoga HuaHin
12	Female	50	Yoga Instructor	Shakti Yoga HuaHin
13	Female	43	Yoga Instructor	Shakti Yoga HuaHin
14	Female	43	Yoga Instructor	Shakti Yoga HuaHin
15	Female	46	Yoga Instructor	Rachaya studio Hua-Hin
16	Female	48	Yoga Instructor	Yoga & I
17	Female	47	Yoga Instructor	Freelance
18	Female	47	Yoga Instructor	Freelance
19	Male	38	Yoga Instructor	Freelance
20	Male	34	Yoga Instructor	Freelance

Findings

Information about yoga destination in Hua-Hin

Since there is a variety of yoga for practice at numerous well-known yoga destination in Thailand, the country is growing in popularity with tourists looking for treatment for the rehabilitation of the body, mind, and spirit. (Wellness Tourism Worldwide, 2011). In addition, Thailand hosts more yoga festivals and events to meet the demands of discerning tourists who wish to travel there to engage in yoga-related activities. Additionally, through promoting Thailand through a variety of tourism avenues, building its brand, and assisting associated industries like the fashion, yoga equipment, and food industries, among others (Ali-Knight & Ensor, 2017).

The fact that Hua-Hin is one of Thailand's most well-known seaside resort cities with great tourism potential is among its most notable characteristics. Thai tourists have recognized it as a top weekend getaway location for more than ten years. In addition, Hua-Hin is an extremely popular vacation destination for tourists from abroad and is making investments in the tourism industry. As a result, Hua-Hin's sector generates the majority of the province's

income, which is used for a range of initiatives, such as the improvement of people's quality of life and the expansion of public utilities (Janchai, 2016).

The components of yoga destination development

The findings revealed that, firstly, core resources components were applied into yoga destination development were; the readiness of space and equipment, the surrounding attractions, the famous of yoga destination, the safety, the expertise of yoga instructors, the service quality, the authenticity of yoga, the well-being activities and a variety type of yoga. Secondary, supporting resources components of yoga as led to efficiency destination development were; the accessibility, the facilities and amenities, accommodation, a variety of tourist attraction, the local infrastructures and the promoting policy of yoga destination. The findings for these components are discussed below.

Core resources components

Readiness of space and equipment

As indicated by stakeholders involved in the development of yoga destination in Hua- Hin, the guideline of efficiency yoga destination development in terms of place and equipment readiness found that some participant highlighted that “The focus is on renovating the yoga studio to have the original identity of yoga and outstanding, more inviting to experience the atmosphere, including improving the condition of the yoga studio to make it always available and checking the condition of the equipment used in conjunction with yoga practice including the strictness of the cleanliness of the equipment and the yoga practice area is the most important thing to consider,” (OT1 and OT5). However, readiness of equipment for practicing yoga, that is, basic equipment is required for yoga tourists from the beginning level to the professional level, which the yoga studio owner considers the convenience of the tourists, therefore has prepared all necessary equipment is provided to help tourists develop deeper yoga postures and safer. However, if yoga tourists are very aware of cleanliness, some will bring equipment to practice by themselves to prevent infectious diseases according to their own needs.

Surrounding attractions

According to the data collection from stakeholders involved in the development of yogadestination in Hua-Hin, the guideline of efficiency yoga destination development in terms of surrounding attractions found that some participant commented that “*Maintaining the cleanliness of public area to have a beautiful view suitable for a holiday and practicing yoga that stakeholders need to consider and collaborate to make the city a better place,*” (OT3). Due to its location in the scenic surroundings of Hua Hin, a well-known tourist destination, the areas ideal for yoga practice. So, yoga tourists feel a peaceful, fresh atmosphere with the sea and mountains. Therefore, protecting the natural environment is essential if they want to continue having unrestricted access to natural resources. This includes protecting the area around tourist attractions. The management team of Hua Hin City highly values the notion that appealing tourist attractions require a healthy environment, and cleanliness is an important factor.

Famous of yoga destination

As mentioned by stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of famous of yoga destination. The competence and reputation of yoga instructors played a key role in establishing a respectable yoga studio in Thailand by fostering a sense of trust and persuading both domestic and international participants. The yoga management team also provides as a venue for marketing and advocacy efforts to raise tourists' awareness of the importance of both physical and mental wellness. Hua-Hin is also one of the famous resort town destinations and is popular with both Thai and foreign tourists. Which is beautiful, surrounded by nature, has a quiet atmosphere, not busy, suitable for practicing yoga. Moreover, it is also a city with an old style that reflects the classics with a unique identity that is attractive.

Safety

According to the data collection from stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of safety found that some participant commented that *"The emphasis is on security to cover the full tourist destinations both inside and outside of the city by employing security personnel. And nighttime CCTV to give tourists to participate in the yoga activities more confidence,"* (GT2). In addition, the participant (GT4) also stated that *"Focusing on more strict sanitation and hygiene to avoid the spread of COVID-19. as well as offering services for cleaning equipment such as disinfectants Alcohol gel at various places in tourist regions or public areas"*. However, consideration must be given to safety as a key component of the yoga destination's quality. It is also necessary to manage tourist property and life safety, which, in order to be effective, requires for widespread cooperation and sector to aid in developing long-term tourism security measures.

Expertise of yoga instructors

According to the data collection from stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of expertise of yoga instructors. Yoga provides an opportunity to start working in a wellness field that is popular with yoga tourists around the world. Many yoga studios in Hua-Hin require yoga instructors to pass a basic yoga training course or have obtained a minimum of 200 hours of Certified Yoga Instructor Training (RYT) from an affiliated institution of the Yoga Alliance, USA, or the non-profit Yoga Association of America. Also, professional groups for yoga instructors are recognized for providing high-quality, safe, accessible, and equitable yoga courses. Most of the instructors travel to take a yoga training course from India, where yoga was born, a great opportunity to gain experience and the authentic philosophy of yoga.

Service quality

This stated with stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of service quality found that some participant stated that *"The important in the service quality is to instill a service mind for the staff, yoga instructors who are involved in creating satisfaction and impressed for tourists to revisit intention,"* (IT2). Hence, providing quality yoga services, entrepreneurs recognize the importance of a good image of a yoga studio by impressing and creating admiration for their yoga studio by providing a good service. It will be a service of

reception staff, yoga instructors, as well as entrepreneurs themselves, who will work together to help drive the development of wellness services by yoga to be of quality and efficiency, bringing the impression of tourists.

Authenticity of yoga

According to the data collection from stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of authenticity of yoga found that the transmission of the authentic of yoga truly recognizes one's body, leading to the training of the mind to achieve unity between body, mind, and spirit, with tourists coming to the attraction to experience yoga. True self-fulfillment is an essential part of the travel experience, as well as a higher level of marked physical and mental transformation is a key component in deciding to travel to yoga destination.

Well-being activities

As indicated by the data collection from stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of well-being activities found that some participant commented that “*To provide tourists more variety in their well-being experience, yoga should be integrated with other well-being forms of activities such zumba, dancing, and boxing*”, (OT1). In addition, some participants stated that “*Having a variety of well-being activities readiness to tourists coming to Hua-Hin has chosen the service as something that can create satisfaction and lead to word of mouth and return visits*”, (IT7). So, yoga combined with other well-being promoting activities provides a full balance of their body, reducing the pain of heavy exercise, and making yoga more exciting and challenging to practice and not getting tired of traditional activities.

A variety type of yoga

As mentioned by stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of A variety type of yoga found that yoga styles have different poses and levels of difficulty, and there are different types of breathing methods in which each trainer has different training abilities in each individual, which must begin to train appropriately for their body in order to achieve the purpose of practicing yoga. Moreover, the yoga studio has managed a variety of yoga classes to accommodate a variety of yoga tourist, starting from the beginning to the top of the yoga. Each instructors have a different teaching and training style. By the way the instructors have to choose to suit the needs of the results and their body's ability to fit the yoga style. The popularity of yoga style is mixed because yoga tourists have variety of age groups. Hence, tourists have different skills. Therefore, instructors must also have a variety of yoga styles to be ready to serve variety tourists. The schedules should be diverse and arranged to serve tourists more efficiently.

Supporting resources components

Accessibility

According to the data collection from stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in

terms of accessibility found that some participant commented that “Giving importance to transportation services to be ready to serve long-distance tourists who want to travel both in HuaHin City and outside Hua-Hin comfortably,” (OT5) . The GT1 participant further stated, "Most visitors to the city experience the issue of unfair taxi charges. To prevent problems in the future, it is necessary to ensure that the service and standard taxi charges are regulated”.

Facilities and amenities

This stated with stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of Facilities and amenities found that some participant stated that *“The development of wireless internet service, or Wi-Fi, to cover all tourist sites in Hua Hin is what needs to be taken into consideration as the next point in order to accommodate tourists,”* (GT5) . Moreover, participant commented that *“in Hua-Hin, tourist destinations still need to be developed and renovated in view of the fact that public toilets at service locations are still unclean and not available to use, despite the fact that these are important for tourists,”* (IT5). So, facilities and amenities can make yogatourists traveling to Hua Hin comfortable. And always impressed, which led to re-visiting again, as most of the participants commented in the same way that the facilities and amenities that meet the needs of yoga tourists in the Hua Hin area are well-equipped and diverse can accommodate many tourists.

Accommodation

According to the data collection from stakeholders involved in the development of yogadestination in Hua-Hin, the guideline of efficiency yoga destination development in terms of accommodation found that some participant suggested that *“Hua Hin is a distinctive city worth seeing, thus pertinent organizations and lodging providers ought to encourage the development of accommodation or the preservation of the lodging's traditional Thai personality. In addition to preserving Thai culture for the future, this will be a novel experience for foreign tourists who have never seen anything like it before,”* (OT1 and IT1) . Furthermore, the coding participant at OT3 commented, *“Currently, people tend to turn to health care increasingly. In order to increase revenue following the covid-19 pandemic and improve the vacation experience, concerned business owners can encourage additional packages to provide their hotel guests with wellness courses to explore new routes”*.

A variety of tourist attraction

As mentioned from stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of A variety of tourist attraction found that some participants highlighted that *“SHA is a project to upgrade the Thai tourism industry to sanitary safety standards to ensure tourists that everyone will be safe, sanitary, and happy from each trip. It places great importance on strict guidelines for the preparation of guidelines for visiting or accessing tourist attractions, including any prohibitions that should be followed for the safety of tourists,”* (GT5). Furthermore, according to the participant code at OT4, *“Public sector should cooperate with the private sectors to promote more eco-tourism by conserving and restoring natural resources and the environment of Hua-Hin tourist attractions including the continuation of Thai arts and culture to be widely known to tourists and can create value for local products and tourism services as well.”* However, the destinations in Hua Hin are one of the components to produce a pleasant experience and impress the wellness tourists who are traveling to join the yoga

practice, with most of these tourists focusing on relaxing and must take traditional tourism more seriously and benefit from it rather than contemporary tourists.

Local infrastructures

According to the data collection from stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of local infrastructures found that some participants commented that *“Hua-Hin area's water supply system must be improved and developed to be more effective so that locals and visitors who stay overnight can benefit from it”*. Additionally, *“during the rainy season, there are difficulties with road flooding where the drainage system is not good. To prevent flooding, which is a problem for the local population, relevant agencies should enhance and build drainage infrastructure. and vacationers who are on the road,”* (OT2 and OT4).

Promoting policy of yoga destination

According to the data collection from stakeholders involved in the development of yoga destination in Hua-Hin, the guideline of efficiency yoga destination development in terms of promoting policy of yoga destination found that some participants suggested that *“The growth of yoga tourism should require collaboration throughout all industries. To encourage the growth of yoga tourism worldwide, hold a yoga festival called New Normal. This will make Hua Hin the hub of yoga tourism, attracting visitors from all over the globe to practice yoga there in the future,”* (IT1 and IT4). Moreover, *“Focus on stimulating the image of yoga tourism through online media channels that are currently popular and can quickly create awareness for both Thai and foreign tourists as well,”* (OT5).

Theoretical and Practical contribution

This study provided important contributions to theory, focusing on the effectiveness of the yoga destination development model, and is founded on two primary yoga resources: the core and supporting resources. The core resource includes: readiness of space and equipment, such as yoga mats, straps, blocks, and mat cleaning wipes; nearby attractions; well-known yoga destinations; safety; the skill of yoga instructors; the standard of the service; authentic yoga; and well-being activities, such as Ballroom dancing, Pilates, meditation, Zumba, and various types of yoga. The supporting resource consists of: accessibility, amenities, facilities (such as restaurants, retail centers, entertainment, and gift shops), accommodation, and a variety of tourist attractions (such as natural, cultural, historical, recreational, and yoga destination-promoting policies). The development of a yoga destination will therefore be pushed forward by stakeholders such as owners of yoga studios, instructors, government sectors, owners of accommodation, and operators of restaurants, giving priority

to each element that can enhance and boost tourists' satisfaction and intent to return. As shown in figure 2 below.

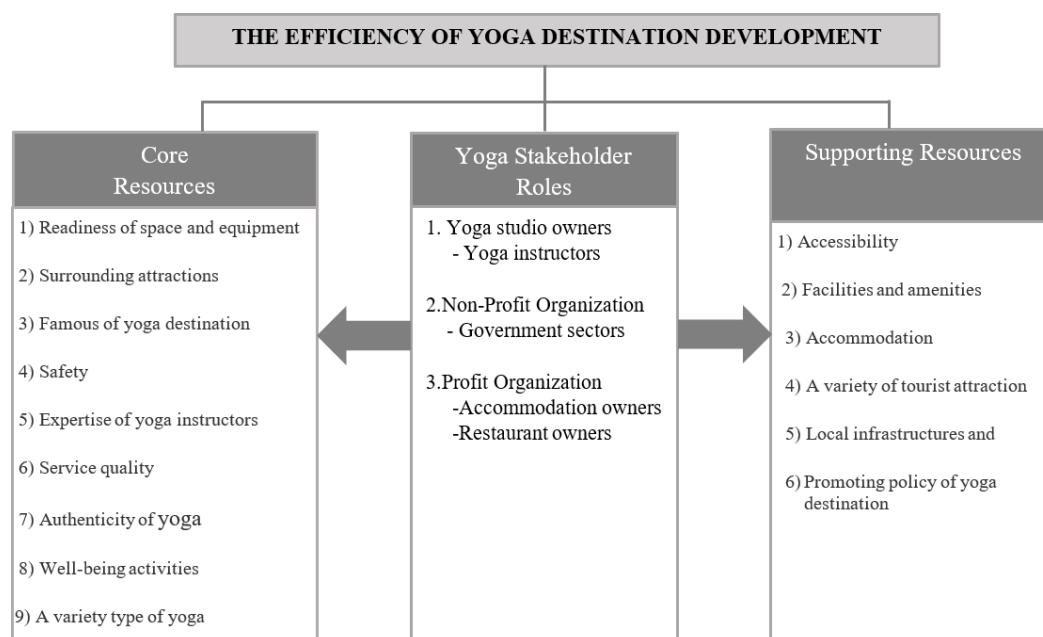


Figure 2: Components of yoga destination development (YDD)

Source: Developed for this study

From a practical perspective, the main contribution of this research is that all stakeholders must be involved in the development of the Yoga destination in order to satisfy tourist happiness, and also that core and supporting resources must be developed and supported. Planning an efficient collaboration that makes use of the skills of all stakeholders should be the authority's effort. First and foremost, yoga studio owners and instructors contribute a significant role in the development of tourist-friendly yoga destinations. They need to start developing a yoga program that incorporates other wellness practices that promote the transformation of the body, mind, and spirit, such as diminished rage, improved emotional regulation, and better physical form. In particular, careful adherence by practicing their body through various asanas and breathing through pranayama principles in accordance with the philosophy of authentic yoga is preferred to creating a modern yoga. Tourists are more interested to more traditional yoga practices. Moreover, yoga instructors must be fluent in English, be able to deliver high-quality services, and have completed training at an institution authorized by the Ministry of Education and the Yoga Alliance USA. Second, the government sectors have a role to manage in developing, planning, and enhancing tourist attractions so that they have beautiful scenery with real naturalness suitable for relaxation and rejuvenation. They also have a role to perform in promoting the image of the region as a hub of yoga tourism by disseminating information through online channels such as Facebook, YouTube, websites, and by hosting yoga festivals. Additionally, it provides global standards for operating a yoga studio and encourages yoga instructors to enroll in additional training programs. The recommendations also include the creation of a yoga association to perform as the primary host for a physical center for yoga tourism as well as the growth of an international yoga network to increase the market for yoga tourism.

Recommendation for future research

Therefore, it is recommended that future researchers undertake an in-depth study from the attitudes of tourists in order to gain more clear and in-depth data leading to effective yoga destination development. This study was conducted using qualitative research from stakeholder perspectives. Future studies should use these fundamental ideas to expand the study's concerns to other wellness pursuits.

Limitation of the study

The study was undertaken during the COVID-19 epidemic, which presented various challenges for the researchers. The health of the stakeholders had to be given priority in the data that was gathered by mobile phone. Additionally, some people declined to participate in the interview, so researchers must continue to gather additional interviews. Future studies on the growth of yoga tourism from the viewpoint of stakeholders can build on these constraints.

About the author

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Associate Prof. Ann Ashton graduated with a PhD and master's degree from the University of Queensland, Australia. She is currently working as the Associate Dean for Administration at the Graduation School of Tourism Management, National Institute of Development Administration (NIDA) in Bangkok Thailand. She has experience working in the hotel industry and spent the 2008-2010 school years as a teaching assistant at the University of Queensland in Australia and universities in New Zealand. She is presently conducting research projects in the areas of wellness tourism; active aging for wellness tourist; sport and leisure tourism

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