Feasibility Study of Real Estate Development Projects: A Case Study of a Housing Development Project in Krabi Province

Paikarn Raksasutiphan*, Mallika Jongsiri, and Saijai Lorpensri

Faculty of Architecture, Rangsit University, Pathum Thani, Thailand
*Corresponding author, E-mail: Paiboon.r@rsu.ac.th

Abstract

Due to the COVID-19 pandemic, people's lifestyles have changed to focus on well-being. The development of real estate projects in Krabi Province, with its natural beauty and surrounding marine attractions, presents an attractive opportunity for entrepreneurs and investors. The area also has a growing tourism potential and a need for housing. This feasibility study assesses investment opportunities and returns by analyzing the physical potential of the land development as well as laws and restrictions in accordance with the needs of the target group. Each housing project in Krabi has a unique architectural style that reflects its the context. This study focuses on the limitations and solutions for architectural design, site planning, and landscape architecture on steep slopes and proposes design guidelines for real estate businesses and investors.

The development methodology involves studying relevant design concepts, collecting data on the physical potential of the study area, and analyzing design issues related to steep slopes and the limitations of space usage in activities with various slopes. The results of this study include project components, salable area proportions that generate returns on investment, and meeting the needs of project target customers. This includes determining the selling points of architectural design, conceptual and site planning, and residential and related buildings.

The study will serve as a prototype of the architectural design process for housing and real estate development projects as well as provide feasible architectural designs that meet market needs and create design guidelines for potential areas and unique contexts, resulting in the ultimate success of the business.

Keywords: *Feasibility Study, Real Estate Projects, Housing Development, Conceptual Plan, Site Planning*

1. Introduction

Krabi Province has a tourism potential that is bolstered by the abundance of the surrounding nature and the marine attractions. This location has become a destination for entrepreneurs and investors who are interested in investing in real estate projects, particularly in housing for the local population. This housing development project is located on Petchkasem-sriphangnga Road, Pak Nam Subdistrict, Mueang District, Krabi Province 8100. The land area is situated between the Pla Lang and Talat Kao Intersections which connect the three main roads and lead into the old town district. The area of this project is approximately 73 rai, 2 ngan, and 16.3 square wah. The potential of the sloping project location is distinctive, since it allows a high-angle view of Krabi City. Both the view and the natural environment are beautiful. However, legal limitations are restrictions on building construction, size, and height. This feasibility study for the housing development projects assesses investment opportunities and returns by analyzing the physical potential of the land development, laws, and restrictions in accordance with the needs of the target group interested in this province's context.

The design concept considers the trend of multi-generational living, healthcare as a new lifestyle concept, principles of design on steep slopes, and tropical architecture that matches the area's context. Due to the tropical climate with abundant rainfall for 8 months or all year long, processes and solutions for this issue should be discussed. The conceptual framework (Figure 1) of this study is the relationship between the potential of the project location to determine the project's target audience, project value, and investment possibilities.

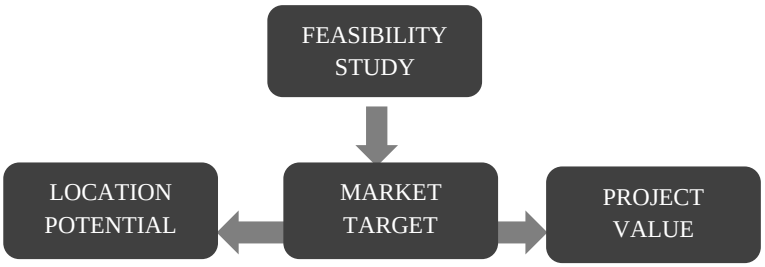

Figure 1 conceptual framework of Krabi housing project development

The potential of the sloping project location is an outstanding feature of the area, making it a selling point for different housing styles. This is derived from the analysis area for building use, open space, facilities, and the master plan's system work. According to the design principles for sloping areas and for the year-round rainfall context, despite the legal limitations such as market and investment conditions, presenting concepts and styles in architectural design will eventually create value for the project's success. The principles of design on steep slopes are tabulated in Table 1.

Table 1 Principles of design on steep slopes (Booth, 1983)

Characteristics	Design Criteria
Very flat, slope 0-1%	Poor drainage, suitable for sequencing the main components of a project
flat, slope 1-5%	Suitable for outdoor utilization such as a parking lots, sports fields, or activity fields
little slope, slope 5-10%	suitable for all types of utilization, depending on direction, building orientation, and drainage
Moderate slope, slope 10-15%	Too steep for some applications, functions should be placed parallel to the level line and adjust the area as little as possible to prevent soil erosion
Extreme slope, slope 15% or more	Too steep for any use, need special techniques in construction to solve problems, should be preserved as a green area

Finally, the feasibility study of this real estate development project will meet the needs of projects on steep slopes, be appropriate to the area contexts, and meet the desires of the target group. Residential development in this area with outstanding physical and architectural design has high possibility to generate more project value than competitors in the same market.

2. Objectives

1. To study the marketing approach for the design of real estate development in Krabi.

2. To analyze planning issues related to steep slopes and understand the limits of space use for activities with different slopes (a Case Study of a Housing Development Project in Krabi Province).

3. Materials and Methods

3.1 Feasibility studies of real estate projects in Krabi

The Krabi project involves three feasibility studies - physical, marketing, and investment studies - to analyze the data and define the architectural design program and layout concept. These studies will be conducted in the following manner as shown in Figure 2.

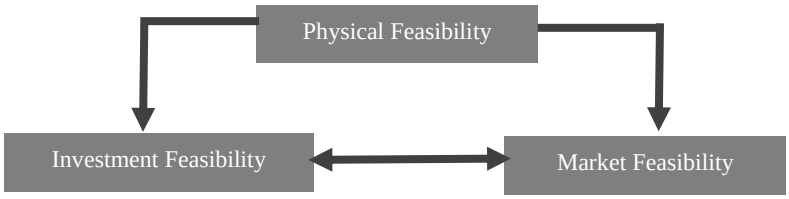

Figure 2 Components of the feasibility studies for Krabi housing projects

3.1.1 Physical feasibility involves legal possibility regulations (law & regulation feasibility).

Town Planning Law supervising the construction and allocation of relevant condominiums, including.

- Land Law Code 1936
- Town Planning Act B.E. 2518 and the general town planning requirements of each area
- Revenue Code
- Building Control Act B.E. 2522
- Ministerial Regulation No. 1 according to the Construction Control Act B.E. 2479
- Local regulations on construction
- Condominium Act B.E. 2522 and Ministerial Regulations on the Definitions of Condominiums, ownership registrations and juristic persons of condominiums, Condominium Act B.E. 2535
- Citeria and ownership by non-local citizens

From the study of various options, we decided to design no more than 99 single houses and a condominium with a height limit of 23 meters. Additionally, the area of each building will not exceed 2000 square meters.

3.1.2 Market feasibility involves STP (segmentation, targeting, positioning). The concepts are as follows: (Thaiwinner, 2021).

- Segmentation refers to market segmentation (customer segmentation). Segmentation analysis or market share analysis involves looking at the overall market to determine which segments are particularly profitable or have high sales potential. Based on a study of market share of real estate projects in nearby areas, it was found that the projects can be divided into housing estates and condominiums.

- Targeting involves selecting a target group based on the data obtained from segmentation and choosing the group with the greatest size and growth potential that is also suitable for the product and organization. The study of the target group showed that the main target group for the project is people aged 30-45 years (80%), of whom 80% are Thai and 20% are registered companies in Thailand.

- Positioning refers to marketing positioning, which involves defining selling points and brand positions for the product. The unique selling point should match the main target group and be appropriate for such target group.

3.1.3 Investment feasibility or financial feasibility involves the business model of the projects.

The possibilities and the suitability of a business model are the forms of generating income and reasonable profits that a business can achieve. Entrepreneurs must consider the possibility of applying a business model that suits their business type and determine if the business can generate reasonable profits for the business sustainability (Promsiri, 2022).

The business model can be divided into the following formats:

- Outright sales in the residential section
- Outright sales and hire-purchase forms for condominiums

Financial possibilities include income from the planned sale area of no less than 55% of the residences which is designed for both low-rise buildings and vertical condominiums. The payback period and return on investment should also be taken into account.

3.2 Study of architectural design projects

Slope design analysis includes the factors shown in Figure 3 and Figure 4.

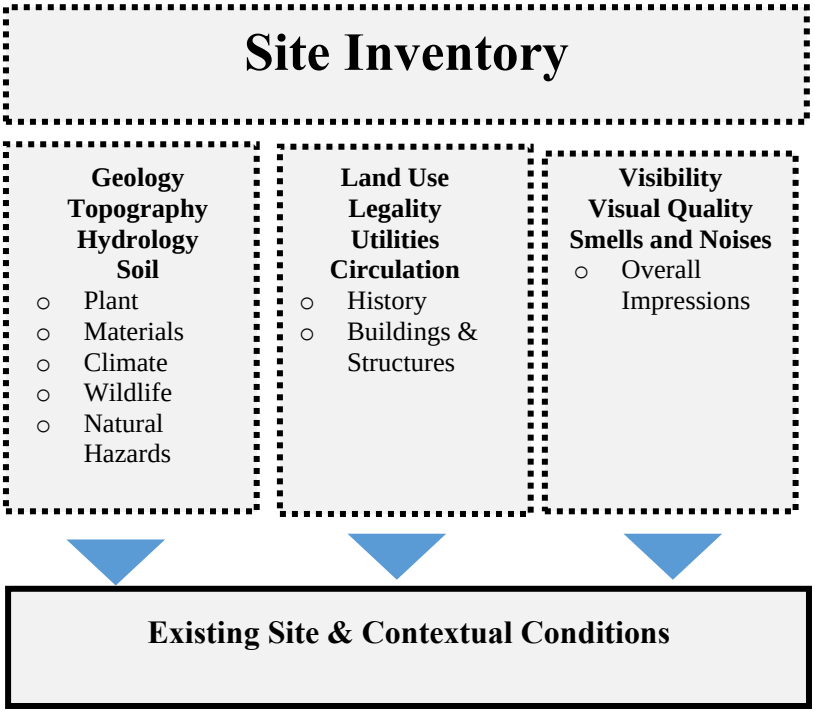

Figure 3 Factors of slope design analysis (Marsh, 2021)

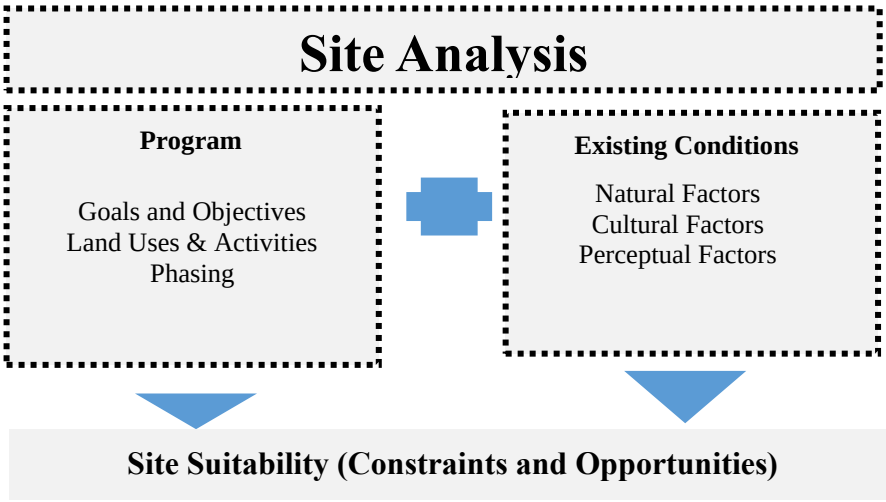

Figure 4 Site analysis principles for slope design

Photo source: lecture document, Assoc. Prof. Dr. Chaiyasit Dankittikul, Architectural Design Course 7, Faculty of Architecture, Rangsit University (Dankittikul, 2022).

The study of the area limitations to determine the suitable areas for housing, commercial area development, facilities, green areas, and roads, within the project is summarized in the Table 2.

Table 2 Project elements & area requirements

No	Details of land use	Area size (square wah)	Area proportion (percentage)
1	Residential sale area (divided land for horizontal housing projects)	5,200	33.5
2	Residential sales area (divided land for condominium projects)	2,182	14.08
3	Commercial rental space	1,746	11.27
4	Landscaping areas, including common gardens, ponds, or canals	4,528	29.21
5	Roads and facilities, including children's playgrounds, exercise fields, bike lanes, and jogging tracks	1,850	11.94
	Project total area	**15,500**	**100**

The conceptual design of the project focuses on the preservation and harmony with nature by designing houses and condominiums in consistency with the slope of the area. Renewable energy from natural sources is utilized in the project. Green areas in Krabi are increased to meet the needs of customers or residents who want houses and condominiums that provide a sense of relaxation and a vacation-like atmosphere for themselves and their loved ones, rather than just a place to live. The details of the usable space are as follows:

1. The total area of the project is 15,500 squares wah (62,000 square meters).
2. Residential sale area (Land divided into horizontal allocation plots and the land that is divided into condominiums):

2.1 Housing area = 5,200 square wah (20,800 square meters)

- TYPE A (customers: new families) = a land of 65 square wah with 15 houses at 260 square meters each at a price of 7 million baht or more
- TYPE B (customers: young generations with career success)
- = a land of 75 square wah with 27 houses at a size of 300 square meters each at a price of 10 million baht or more
- TYPE C (customers: young generations with career success)
- = a land of 100 square wah with 22 housed at 400 square meters each at a price of 15 million baht or more

2.2 Area of the condominium projects = 2,182 square wah (8,728 square meters)

- TYPE A =15 units at 30 square meters at a price of 2,700,000 baht each
- TYPE B (customers: young generations with career success) = 17 units at 50 square meters at a price of 4,500,000 baht each
- TYPE C (customers: young generations with career success) = 30 units at 70 sq m. at a price of 6,300,000 baht each

3. Commercial area and clubhouse (service & facilities) = 1,746 square wah (6,948 square meters)
4. Road area = 1,850 square wah (3,400 square meters)
5. Garden area = 4,528 square wah (18,112 square meters)

3.3 Site Analysis

Site analysis (Figure 5) involves more than just data analysis. The direction of the sun from east to west, the shade at different angles, the slope, and the beautiful scenery at different heights were taken into account, along with the location of the buildings in the project. It is important to note that the location in the middle of the site, at the highest point, will offer the most beautiful views. Therefore, the central building will be positioned as the reception point. The left side of the hill will be the location for the condominium buildings, while the right side of the hill which is a very steep area will be transformed into a green garden. The residential buildings will be placed in descending order by selling price, with the most expensive being at the top, as shown in the picture.

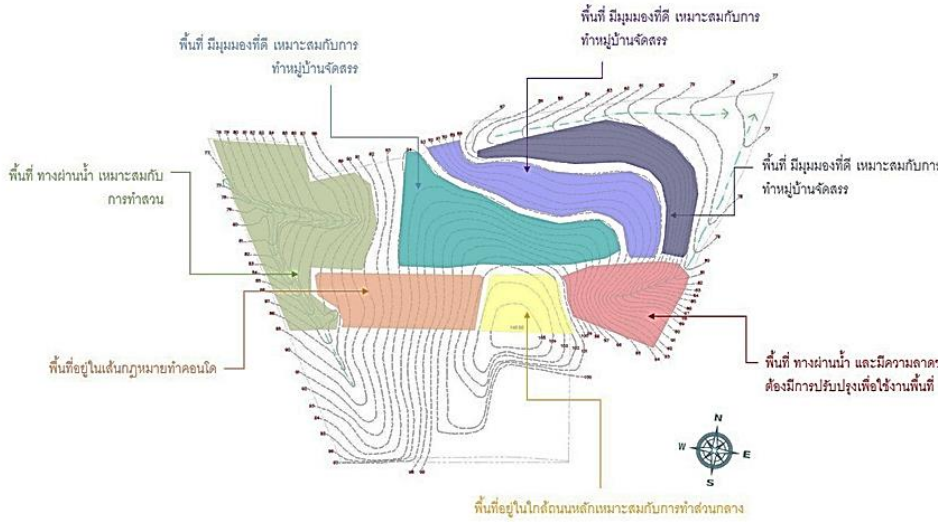

Figure 5 Site analysis

3.4 Project concept (project value)

The project concepts or the project value derived from the strengths of the context of the project area, including:

- Economy benefits
- Social benefits

Project design ideas:

UTOPIA BLENDING FOR LIVING: Living in harmony with nature, be a part of nature without destroying nature

4. Results and Discussion

Results

4.1 Conceptual plan, zoning land-use

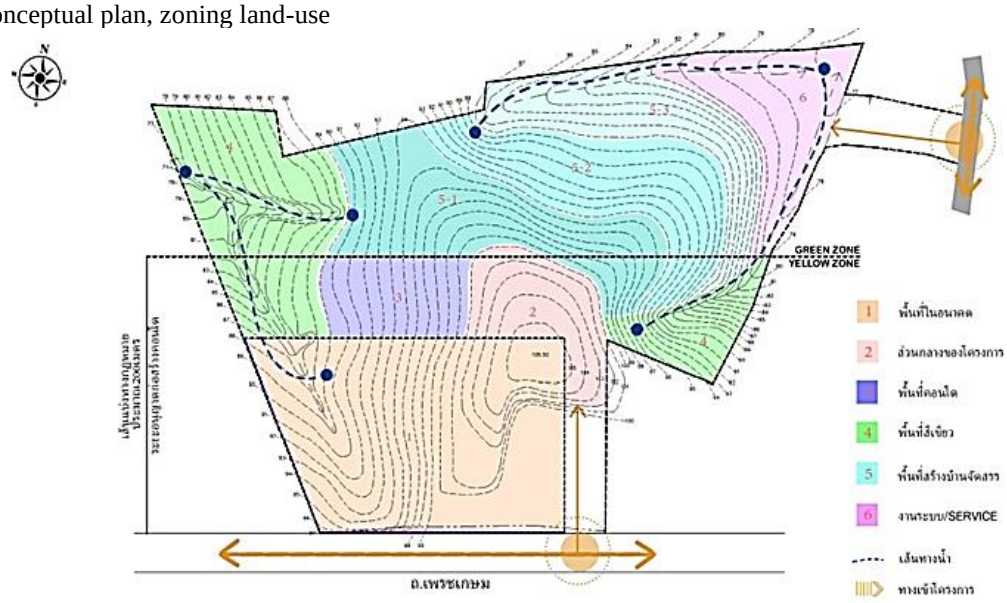

Figure 6 Conceptual plan and zoning land-use

The conceptual plan and land-use zoning (Figure 6) have divided the entire piece of land into two Phases. Phase 1, located next to the main road, has been set aside for future construction (number 1, cream color). Phase 2, which is the remaining area at the back, will be the current construction area with zoning related to the slope. The highest point, which is the central area of the project (number 2, pink color), consists of a reception area, restaurants, and shops. Next area is Number 3 (purple) which has been designated for a condominium (Number 4) with a green area set aside. Housing has been allocated in area Number 5 (blue color), following the slope's height. A large house at a price of 15 million baht is located at the top, followed by houses at a price of 10 million and 7 million baht respectively. The edge of the land, Number 6 (dark pink color) is used for service and building systems.

4.2 Master plan

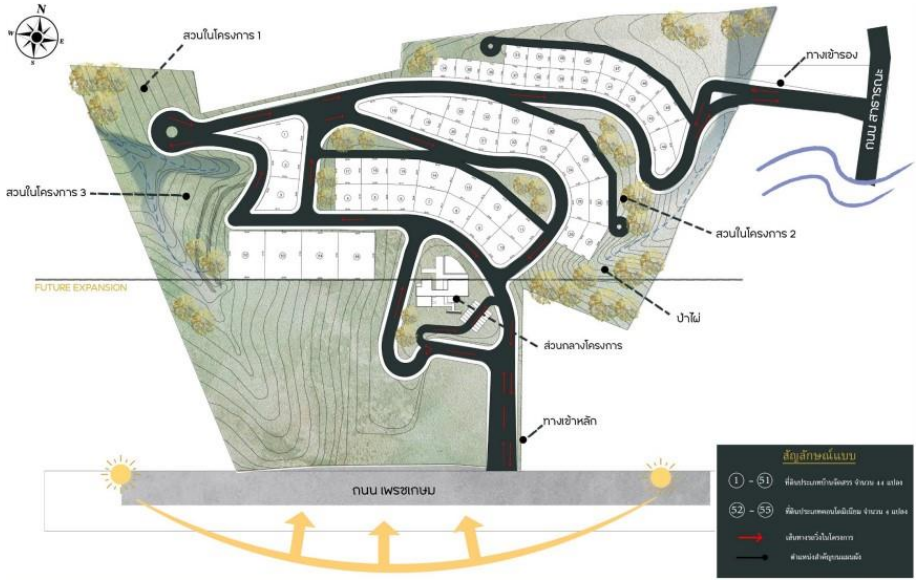

Figure 7 Building orientation according to the sun direction

The zoning has been determined by analyzing the climate and terrain, including high and low slopes to properly place buildings and provide easy access to internal roads (Figure 7).

4.3 Housing

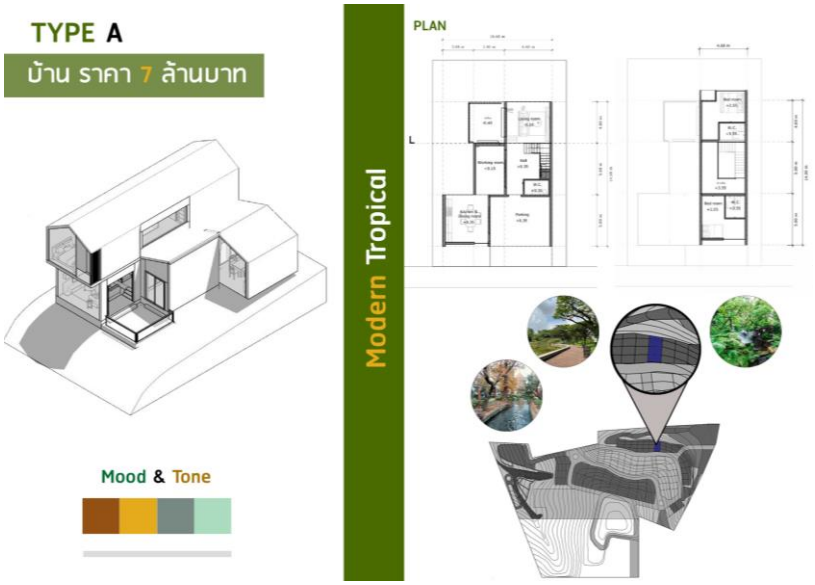

Figure 8 Type A house

Figure 8 shows the TYPE A house model (for new families) for 15 units. It has a land area of 65 square wah, a house area of 260 square meters, and a price of 7 million baht or more.

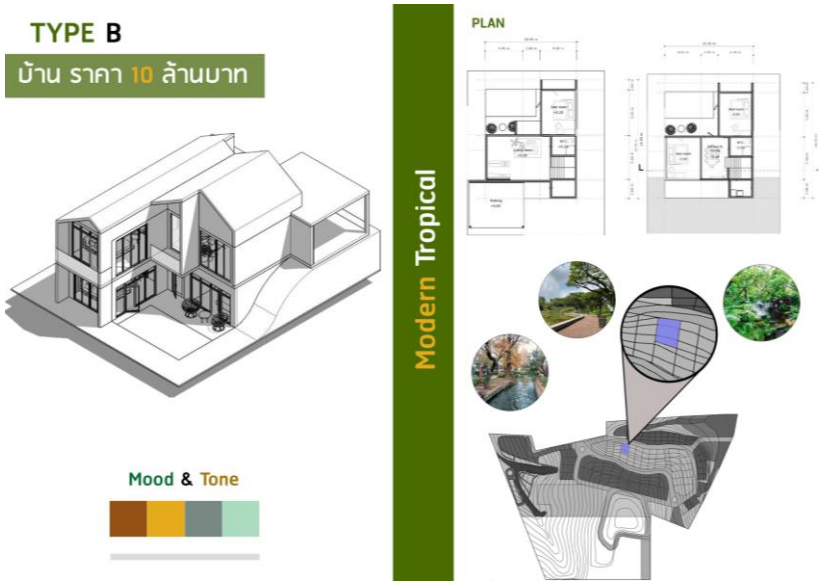

Figure 9 Type B house

Figure 9 shows the TYPE B house model for 27 units (customers: young generations with career success) with a land area of 75 square wah, a house area of 300 square meters, and a price of 10 million baht or more.

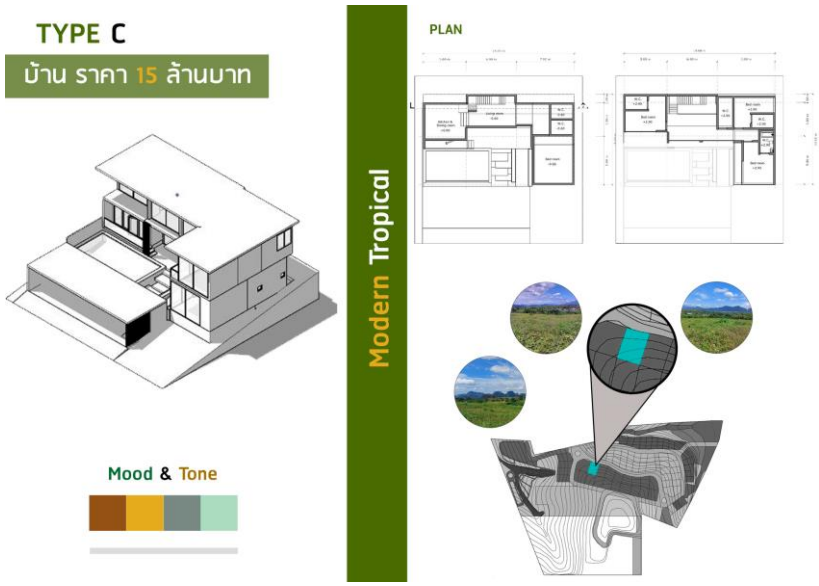

Figure 10 Type C house

Figure 10 shows the house model TYPE C for 22 units (customers: young professionals and families) with a land area of 100 square wah, a house area of 400 square meters, and a price of 15 million baht or more.

4.4 Condominium

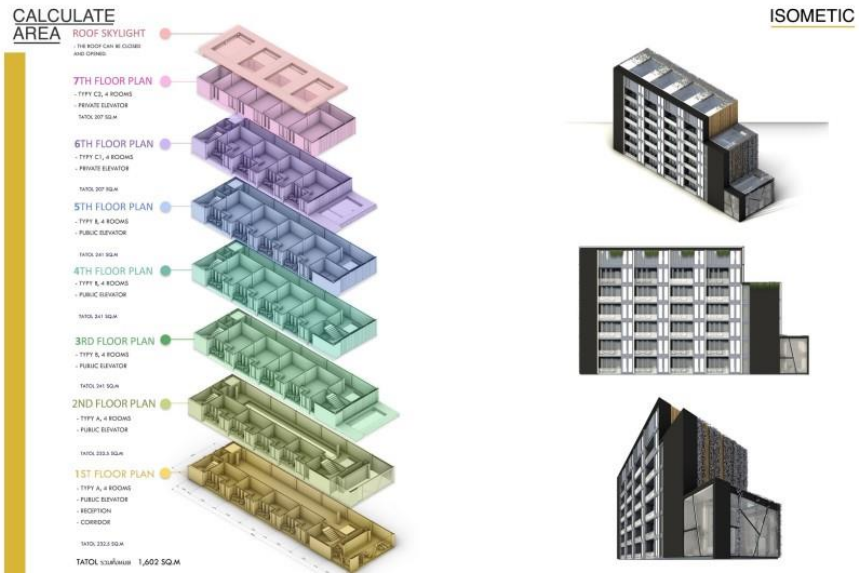

Figure 11 Condominium plan

The condominium building (Figure 11) has a total of 7 floors, which is the maximum height allowed by law. The ground floor comprises a reception hall, corridors, and 4 Type A rooms. The 2nd floor consists of 4 Type A rooms, the 3rd to 5th floors consist of 4 Type B rooms each, and the 6th and 7th floors consist of 4 Type C rooms. The top floor is a rooftop area.

Figure 12 Perspective of the condominium

Figure 12shows the condominium complex and the front yard.

5. Conclusion

To invest in real estate projects in Krabi, it is necessary to conduct marketing studies and feasibility analysis. The market analysis will help identify the demand for housing in the Krabi area and the potential target market for the project. The user needs can be classified into three groups: the first group is new families who want a moderate-sized house with a price of about 7 million baht. The second group is young generations with career success want a medium-sized house with a price of about10 million baht. The third group is young professionals and families who want a large house with a price of about 15 million baht.

The architectural design and development of these real estate projects must be suitable for the conditions of the area and the weather in Krabi. The strengths of the land contour and open view should be utilized to place the buildings as much as possible in order to reduce the amount of cut and fill work of the soil. The building design should be based on the slope. The placement of the building must be carefully considered to avoid the overlapping or straddling of the mound and to avoid natural waterways that can cause water erosion. Architects and designers must analyze the layout of the site and create a drawing plan based on the terrain. Building a foundation on level ground with modern technology is relatively simple. However, building on a steep slope requires special attention. Although homes located on slopes have some advantages, such as better protection against wind and flooding, they also have some disadvantages, such as susceptibility to soil softening and topsoil changes due to high rainfall and ground water. This can lead to undesirable consequences. Therefore, it is very important to correctly select and build the foundation. Even though the foundation ribbon is a popular design, experts recommend building this type of foundation only on slopes with the lowest inclination. It is important to consider the recommendations of surveyors and other professionals to ensure the safety and stability of residential and real estate projects. Understanding the weather and humidity is also crucial, as the rainy season in Krabi lasts longer than in other regions.

6. Acknowledgement

This research study was successfully completed with the great kindness of our research participants. I would like to thank them for their help.

7. References

Booth, N. K. (1983). Basic Element of Landscape Architecture Design. (n.p.): Elsevier, Illinois: Wave land Press Inc.

Dankittikul, C. (2022). *Architectural Design Course 7*, Faculty of Architecture Rangsit University. (in press)

Marsh, W. M. (2021). Landscape Planning: Environmental Applications. 5th ed. New Jersey: Wiley & Sons.

Promsiri, T. (2022, April 21). What is Feasibility Study and Imporatnce for Business Plan. Retrieved from https://www.neobycmmu.com/post/feasibility-study

Thaiwinner. (2021, Dec 16). What is STP? Analysis method+benefits+examples [STP Marketing]. Retrieved from https://thaiwinner.com/stp-analysis