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ASPECTS OF LAND USE GOVERNANCE ON PANGKOR ISLAND

Ng Ming Yip (a)*, Jamilah Mohamad (b), Goh Hong Ching (c)

*Corresponding author

(a) Institute of Postgraduate Studies, 50603 University of Malaya, Kuala Lumpur, Malaysia,
mingyip@um.edu.my

(b) Department of Geography, 50603 University of Malaya, Kuala Lumpur, Malaysia,
jamilahmd@um.edu.my

(c) Department of Urban and Regional Planning, 50603 University of Malaya, Kuala Lumpur, Malaysia,
gohhc@um.edu.my

Abstract

The growth of world's population directly causes depletion of natural resources, including land resources to meet the demand for food, house and other human needs. Limited land resources and rising demand in turn lead to conflicts in land use. In the context of developing an island, scarce land resource is often an important issue that becomes the public concern. Governance of land use in an island is different from the mainland where it is influenced by factors such as limited land resources, population growth, sectoral competition for land use and carrying capacity. Challenges that exist on Pangkor Island today are mostly centered on the issue of housing, infrastructure, utilities and waste management where the efficient and effective land use planning and development is indispensable to solve these issues. This study discusses the aspects of land use governance with specific reference to one of the famous tourist islands in Malaysia. In Malaysia, an institutional actor is a dominant actor in the governance process of land usage while the private sector and civil society have its own function in the entire network of governance. For each existing proposal of land use, a complete information system will have data on its type, location, amount, condition, quality, timing, and cost. In the traditional land information system, at least up-to-date type, location and amount data are required for accurate land planning. Land use can also be classified into five different dimensions; namely general site development, economic "over-use", activity characteristics, site adaptation and actual use.

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Keywords: Land use governance, land use issues, classification of land use, dimension of land use, Pangkor Island.



1. Introduction

Land is an important earth's natural resources for human, animal and plant. In daily life, human use land as a primary source for various objectives and activities. The purpose of land use is not limited to one, but it's always changing. Land use is able to meet human demand for space, settlement and redevelopment. Conventionally, we use land to produce food, fibre, timber, energy and other resources. Likewise, land rivalry, resource extraction and conservation are becoming more common. Today, the use of land has been commercialized and is more business oriented (sale and purchase of land) and emphasis on human will. This is because the land is no longer accessible for free, and we have to pay high purchase costs, especially in areas with limited land resources. In addition, the land has become a crucial resource in the process of physical development, especially in areas that are experiencing rapid urbanisation process.

The process of land development is both complex with requirements and procedures, and diverse due to the involvement of many parties with different aims, roles, interests, strategies and actions (Ratcliffe & Stubbs, 1996). Land exploitation by man affects land cover (Fresco, Stroosnijder, Bouma & Keulan, 1994). Undeveloped land will be used for various development purposes as per demand. A land will be developed when there is an agenda or purpose for development. In this context, the agenda or purpose of development acts as the primary factors apart from the others (such as human, machine, money etc.) to the overall process of land development, namely the process of converting raw land into developed land. Land is used for various purposes, such as agricultural, industrial, housing, tourism and transportation.

In addition, land development is also closely associated with supply and demand factors. The land demand can be influenced by various factors such as income, price, interest rate and the characteristics of population. For example, high income, low-interest rates for hire purchase, large population and geographical distribution will lead to high demand for land resources. While the supply of land is influenced by factors such as physical characteristics (for example; rivers, mountains and steep gradients), density of development, development costs, time period and the tax rate. Land development process involves many stakeholders such as urban planners, architects, engineers, quantity surveyors and land surveyors who interact with each other to discuss on successful implementation of a proposed land development (Said & Ismail, 2012). Demand on land development comes from individuals or a group of people who need land for certain purposes, like industrial, commercial, housing, tourism and transportation.

Growing interest in governance in other sectors cuts across land administration (FAO, 2008). Land use governance is a man's systematic way of governing land changes. Governance is not limited to the government alone, as it is more than that. It is the decision-making process and the implementation of policies involving various stakeholders whereby the overall relationship between formal and informal stakeholders is emphasized (Salfarina, 2011). Theoretically, governance refers to all governing processes, whether it is undertaken by a government, market, or network; by a family, tribe, corporation, or territory; and by laws, norms, power, or language (Bevir, 2013).

2. Problem Statement

2.1. Land Use Issues and Present Concerns

According to the Oxford Dictionary, land can be defined as “the part of earth’s surface that is not covered by water”. In the simplest terms, water makes up about 71% of the Earth’s surface, while the other 29% consists of continents and islands. The problem arose when the 29% of land surface has to be shared by 7 billion people that make up the world population. The growth of world’s population directly causes depletion of natural resources in the world, including land resources to meet the demand for food, house and others facilities. Limited land resource and increasing demand for land lead to conflicts of land use. History tells us about the evolution of land usage from agricultural to industrial that leads to the conflicts of land use. The European countries began with agricultural activities in rural areas and had transformed into cities that rely highly on industrial sector. Development and progress in terms of leader’s ideology, the minds of people, equipment and labour had led to changes in the landscape of traditional to modern. Farming was once characterized by diversified family farms, supported by nearby rural communities. It is now dominated by large farms, monoculture cropping, and consolidated livestock operations, with a high proportion of abandoned land (Mann & Jeanneaux, 2009). Additionally, various groups are demanding alternative land uses, like biodiversity conservation, nature protection, and improvement of rural areas in terms of attractiveness for recreation and tourism (see, e.g., Nohl, 2001; Vos & Meekes, 1999). Competitive changes and continuous increase in population due to continuous growth tend to lead to conflicts in land usage.

Land conflicts commonly become violent when linked to wider processes of political exclusion, social discrimination, economic marginalisation, and a perception that peaceful action is no longer a viable strategy for change (United Nations, 2010). In many African countries, violent conflict is closely related to competition for access to land and natural resources. Competition for land and other natural resources, and the denied access to land by the poor have been, and are sources of conflict in a number of African societies. This situation worsens during drought or natural disasters that destroy various natural resources. Africa with 1.1 billion people as of 2013, accounts for about 15% of the world’s human population. The rapid growth of population and the increase in agricultural and non-agricultural demand for land aggravate potential disputes over land, which are unproductive and, risk favouring biased solutions within weak or inequitable institutional set-ups (Van Der Zwan, 2011).

Malaysia has almost 33 million hectares of land with more than 30 million populations. The 33 million hectares of land need to be shared by more than 30 million people in terms of housing for 6.35 million households, economic sectors such as company buildings for 96,251 registered businesses, agriculture sector such as 3,313,393 hectares of land that is used as oil palm plantation in Malaysia and many other uses of land. However, the level of competition for land in Malaysia varies based on changes in terms of the availability of area, population and resources. Area is an important factor that determines the supply and demand of land resources. Area can be divided into island and non-island (mainland) area.

The land use in island and mainland will have a different experience. Relatively, competition for land use on an island would be greater than that of on the mainland. Land is a limited and precious commodity on an island. Through prior studies, several factors have been identified as variables that can affect the growth and development of land on an island and these variables have certain variation and impact to land use.

Among many islands in West Malaysia, the four islands that have become a major attraction for both local and foreign tourists are the Langkawi Island (in Kedah), the Pangkor Island (in Perak), the Perhentian Island (in Terengganu) and the Tioman Island (in Pahang). The first two islands are located on the west coast of Peninsular Malaysia, whilst the remaining two are located on the east coast (Othman & Rosli, 2011). Pangkor Island is a small island with a total land area of about 8 sq. km and inhabited by 25,000 islanders. It is located about 85 km west of Ipoh, 3.8 nautical miles from Lumut and is separated from the mainland of Peninsular Malaysia by the Straits of Dinding. Due to the rich marine resources, the key economic activity on the island is fishery. Pangkor Island is also promoted as a “3 S” tourism destination. Until the year 2013, a total of 1,001,415 visitors or tourists have visited the Pangkor Island. This amount represents an increase of 16,736 visitors as compared to the year 2012 which recorded 984,679 visitors or tourists (Manjung Municipal Council, 2014). It is estimated that 64% of the local population was involved in fisheries, 24% of them in the business and service sector, and the remaining in the public sector (Manjung Municipal Council, 2014). Of this total, it is estimated that 10% of the local residents was involved in tourism-related business such as restaurants, handicrafts, souvenirs and as accommodation providers.



Figure 01. Geographical location of Pangkor Island in Peninsula of Malaysia

Source. Adapted from google map and <http://www.malaysia-maps.com/malaysia-states-map.htm>

Pangkor Island is well-known as a famous tourist island in Malaysia. According to the Report of National Marine Parks Malaysia: Policy and Concepts 1989 issued by the Department of Fisheries Malaysia, there are three categories of islands located in Malaysia. The three categories of the island are:

the “Development Island” such as Langkawi Island, Penang Island and Labuan Island; the “Tourist Island” such as Pangkor Island and Tioman Island; the “Marine Park Island” such as Payar Island in Langkawi, Harimau Island in Johor and Kapas Island in Terengganu. Pangkor Island as a tourist island shares some common characteristics with another tourist island in Malaysia. Among the characteristics of a tourist island is:

- The islands where most of the basic local economic activities are depended on the tourism sector;
- Well-known within the country and abroad, and has become a focus of tourist activity; and
- Have natural resources and tourist attractions such as historical sites, heritage centres and others.

2.2. Land use challenges at Pangkor Island

Pangkor Island has a moderately-dense population. The geographical situation of the island where majority (1522.67 hectares) of the area is covered by reserved forest. This condition brings certain impact on the development of land in Pangkor Island. The problems that exist have been a major challenge in the process of planning and development of the island in terms of land usage and other sectors.

Pangkor Island Special Area Plan Study has identified several challenges that have been considered in the future planning:

- I. Unbalanced development
 - The development is focused in the western part
 - Lack of physical facilities and unbalanced employment distribution
- II. Slum/squatter housing
 - Provides negative impacts in terms of social, environmental and image of the study area.
- III. The lack of public facilities
 - The lack of public facilities for social activities such as sports facilities, recreation and leisure.

Challenges that exist at Pangkor Island today are mostly centered on the issue of housing, infrastructure, utilities and waste management (*Draft Plan for Southeast Coastal Special Area of Pangkor Island 2015/ Draf Rancangan Kawasan Khas Pesisir Tenggara Pulau Pangkor 2015*):

- Slum/squatter houses along the coastline;
- Dense residential areas and unplanned;
- Shortage of residential land;
- Insufficient Infrastructure and utilities;
- Weak waste management system; and

- Lack of space and facilities for recreational activities.

Constraints on housing development in the tourist island often catches the attention of government agencies involved in the development of tourist island in Malaysia. For example, the Draft Plan of Special Area Southeast Coastal Pangkor Island 2025 has outlined some of the key challenges in development, such as the existence of slum dwelling; residential areas that are crowded and disorganized, lack of residential land, lack of space and facilities for recreational activities. Similarly, the Manjung Municipal Council also identified the same problem from the Local Plan Report.

The land usage conflicts have also affected the area or island. For example, at Pangkor Island, competition for land use has led to other problems involving natural resources, public infrastructures, natural disasters, and transportation problems. Competition for land leads to unbalanced development. There is a development that is not commensurate with the surrounding atmosphere and affects the environment quality. Activities like levelling of hills and upland areas contribute to air and water pollution, and soil erosion. The beaches are often contaminated with waste disposal disposed especially by people living at the coastal area and this view can be seen at the base of the boat Pangkor Island. Since there is not much shade in town, landscape architectural elements such as walkways, street furniture, and decorative plants are introduced, especially in town areas for the use and benefit of the general public.

3. Research Questions

The study was conducted based on a number of set objectives:

1. To identify the governance system on Pangkor Island.
2. To identify land use issues that exists on Pangkor Island.
3. To classify land use data.
4. To analyze dimensions of land use.

4. Purpose of the Study

The study aims to discuss aspects of land use on Pangkor Island. This study has explored the issues of land use, classification and dimensions of land use that exist. Through this study, useful and accurate data and information on land use has been developed and can be used for future sustainable planning purposes.

5. Research Methods

This study uses a qualitative method of collecting data through observation and review of secondary sources. The researchers went to the study area, Pangkor Island to obtain data and information related to this study. Various resources are used to obtain research data including visits to District Office, Head Office, Town Planning Unit and local library. The use of conceptual and theoretical frameworks from past studies is also a key source for obtaining land-use data.

6. Findings

6.1. Classification of Land Use on Pangkor Island

One of the important aspects of land use governance is the land information system. Land use information is an important input to the land resources related decision that involves planning, managing and implementing. It can provide useful information to all stakeholders through the analysis of existing land use data. Kaiser, Godschalk, and Chapin (1995) in their writings explained several key components in land use classification. For each existing and proposed land use, a complete information system would include data on its type, location, amount, condition, quality, timing, and cost. In the traditional land information system, at minimum, up-to-date type, location and amount data would be required for accurate land planning. While the condition, timing, quality and cost are advanced data for planning activities.

Type of land use explains the breakdown of data by multiple classes that are more general in nature. This general classification can be further refined by dividing the class that is general in nature to further levels of increasing detail. Table 1 below shows the distribution of land use by sector on Pangkor Island for 2015. Table 1 represents the land use data obtained from the Perak Department of Irrigation & Drainage and this report shows the land use sectors at Pangkor Island. Whereas, table 2 is a land use data for 2007 provided by the Peninsular Malaysia Town and Country Planning Department showing 13 main categories of land use on Pangkor Island. Based on the land use data, housing and industrial sector were recorded the largest land use on Pangkor Island.

Table 01. Type of land use on Pangkor Island, 2015

Major Land Use by Sector
Housing
Trade
Industry
Education Public Facilities
Public Use
Special Use
Religion Use
Recreation
Infrastructure and Utility
Forest *

*Note: * including forest and limited tourism*

Table 02. Land use on Pangkor Island, 2007

Land Use Category
Housing
Business and Services
Industry
Institutions and Community Facilities
Open Space and Recreation

Vacant land
Transportation
Infrastructure and Utility
Agriculture
Farming and Aquaculture
Forest
Beach
Water body

Source. Study on Carrying Capacity and Development. Guidelines on Pangkor Island by the Federal Department of Town and Country Planning Peninsular Malaysia, 2007.

Location of land becomes an important element in the process of determining strategic place for a development activity. Location of land that has entered the development process may be expressed in terms of a street address, tax map and number, parcel identification number (PIN), or subdivision lot number (Kaiser, Godschalk & Chapin, 1995). Output of land use location vary according to specific development objectives. However, the location of housing areas become dominant at Pangkor Island while forest reserves cover almost 80% of the island. Disproportionate distribution of land use caused land use conflicts. Land use conflicts are caused by inorganic land use development in the study area. Organic development refers to the urban development on Pangkor Island that starts from Pangkor Town (*Pekan Pangkor*) and expands to the western corridor. Inorganic growth, as a result of increase in population led to the existence of unplanned settlements. Industry areas such as workshops, shipping industry, food processing (fish *Satay*), which are based in *Sungai Pinang Kecil* and *Sungai Pinang Besar* are in conflict with the activities of nearby housing area.

Amount of use is expressed as intensity of activity or density of development (Kaiser, Godschalk & Chapin, 1995). On Pangkor Island, a gross density 6.9 person/hectare in 2015 and a net density of 79 people/hectare is maintained to minimize land use. This figure will continue to increase as the population increases due to continued development plans, particularly in the housing and tourism sector. For the purpose of systematic planning and facilitates controlled by the state and local planning authorities, Pangkor Island was divided into 5 major planning blocks (PB) or *Blok Perancangan* (BP) (refer to Figure 2). The largest PB is PB 2 (793.64 hectares) which is Sungai Pinang reserved forest, followed by PB 1 (540.64 hectares), PB 3 (418.60 acres), PB 4 (319.02 hectares) and PB 5 (128.10 hectares) (refer to Table 3).

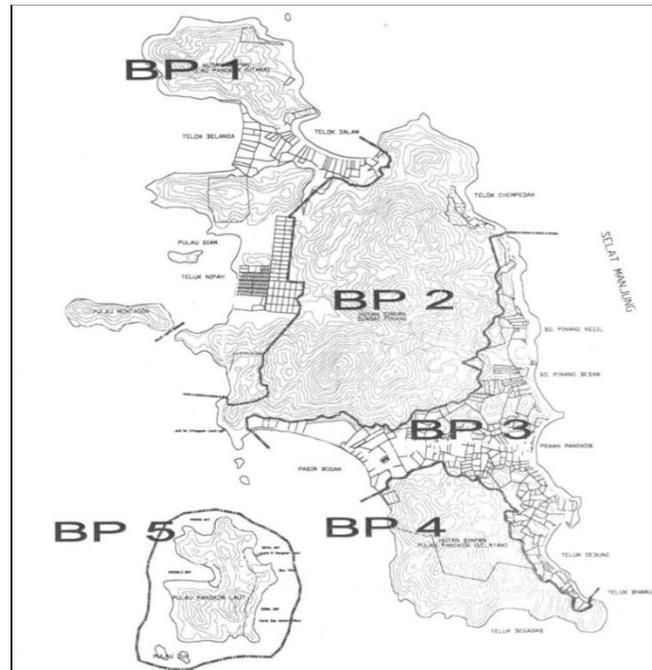


Figure 02. 5 Major Planning Block (PB) or Blok Perancangan (BP) in Pangkor Island

Note. BP in English language (Blok Perancangan) is Planning Block (PB)

Source. Perak State of Town and Country Planning Department. (1999).

Table 03. Planning Block Local Plan for Pangkor Island

PLANNING BLOCK	HECTARES	PERCENTAGES (%)
Planning Block 1 (BP 1)	540.64	24.57
Planning Block 2 (BP 2)	793.64	36.07
Planning Block 3 (BP 3)	418.60	19.03
Planning Block 4 (BP 4)	319.02	14.50
Planning Block 5 (BP 5)	128.10	5.83

Source. Perak State of Town and Country Planning Department. (1999)

PB 3 is the intermediate area of the island and this place is a major focus of residents and tourists. The island development first was focused on this block and the business sector, housing, and transportation grew from here. Majority of the island population is centred on this PB. This PB has a high population as compared to the other PBs. Moreover, most of the main public facilities such as police stations, fire stations, post offices and jetty are also based at this PB. The density of this PB is higher than other PBs. This PB consists of several housing areas/villages, including Sungai Pinang Kecil, Sungai Pinang Besar, Pekan Pangkor, Teluk Kecil, Teluk Gedung, Teluk Bharu and Pasir Bogak.

For more advanced data of land use classification, the next section will use the example of housing and trade/commercial planning that had been carried out by the local authorities through the Pangkor Island Local Plan (1999-2015). Residential houses and shop houses will be used as an example in the explanation for advanced classification data. *Structural condition* contains data about the nature or characteristics of

physical and non-physical interior of a building. It measures the maintenance, repair, and safety of buildings on the site. Elements of comfort and safety are also important to ensure a healthy environment land use. Sungai Pinang is located on the third PB of Pangkor Island. For the development purposes in Sungai Pinang area, the last local plan (1999-2015) has focused on designing a city that contains buildings for residential and commercial purposes. Five types of planned housing existing at the Pangkor Island are detached houses, flats, terraced houses, semi-detached and town house. The planned buildings are houses with 1 to 2 levels with a low-density not more than 20 units/acre. Whereas, for commercial use, there are three types of lot size; open booth/close booth and shop/apartment. The houses are designed in accordance with local characteristics and detached type of house designs also reflect Malaysian culture. Detailed information regarding its structure and condition of the building is as follows:

Housing	Commercial/ Trade
Lot Size	
<p>Detached house The minimum lot size - 45' X 80'</p>  <p>Terraced house The minimum lot size - 20' X 65'</p> 	<p>Shop houses 6.1m X 22.86m</p> 
Building Setback	

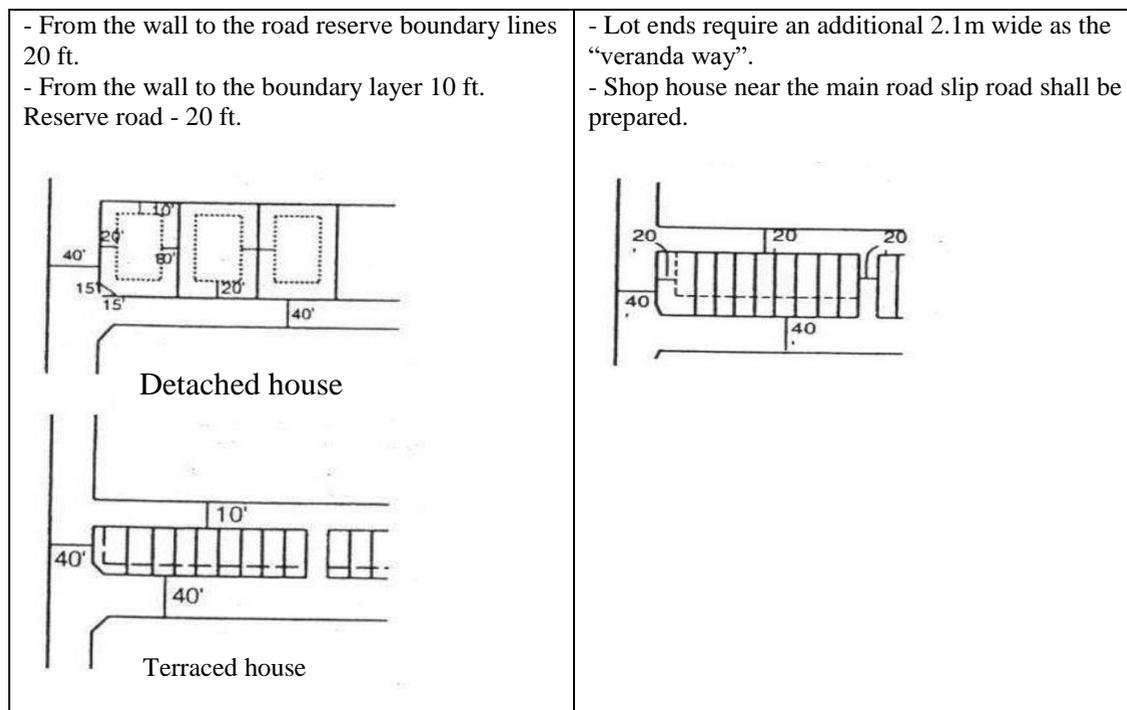


Figure 03. Examples of condition and structure of the building on Pangkor Island.
Source. Perak State of Town and Country Planning Department. (1999)

Quality of land use, taking into account social, economic and environment factors interact with a site or affected areas. For housing and trade land use, there are a few projects outside the building that can be used to measure the quality of life of local communities. The quality of land use contributes to sustainable development when the elements that improve the quality of a city or an area are implemented. For example, construction of more than 30 units of shop house needs site substation that would take up land area of around 2000-3000 sq. ft. Apart from that, the installation of street lights in every type and hierarchical road and water supply should be sufficient for commercial and residential use. On the other hand, waste water must be drained through oil and grease trap before being discharged into the sewage treatment plant. In addition, local planning should also take into account the construction of community facilities such as the headman office, public hall, public library, and additional classroom space in existing schools.

Timing provides currently available data and expected future data. Figure 6 shows the projection of future needs of land until 2015 at Pangkor Island. Projections are estimates or expectations about something in the future, usually based on current data or information. Figures the projection shows indicate that the housing sector is expected to have increasing land demands from one year to another. The increased need for land use in housing sector showed that housing sector is the most important sector in the island and some of the factors that contribute to this phenomenal increase are increment in the island population, demand for housing, competition for housing, and etc. which will be issues the island residents need to face.

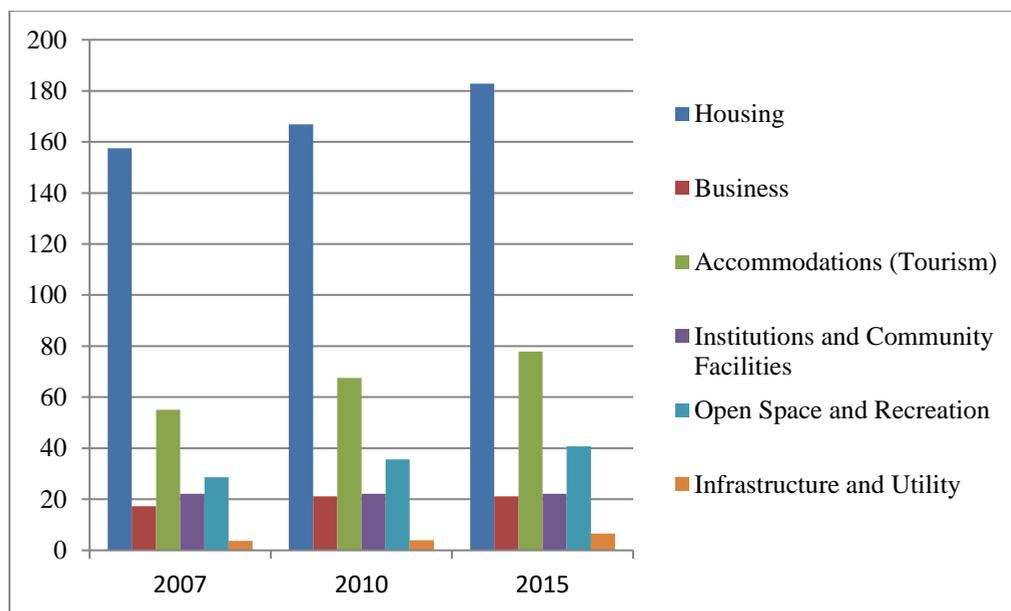


Figure 04. Projections of land requirements up to 2015 on Pangkor Island
 Source. Study on Carrying Capacity and Development Guidelines on Pangkor Island by the Federal Department of Town and Country Planning Peninsular Malaysia, 2007.

Cost is often expressed in terms of assessed value for tax purposes because this information is available as a public record for both the land and structures (Kaiser, Godschalk & Chapin, 1995). Some other measures that could be used include the price to pay for improvements or any renovation and payment for cost of sales of land or houses. Pangkor Island was under the administration of the state of Perak. Affordable houses such as low and medium low cost house is the type of house in high demand across the state, including Pangkor Island, as set out under the 7th Malaysia Plan (see Table 4). For land owned by government and private sector development, provision of low cost housing ratio is subject to the decision of state government from time to time. The balance of the provisions for low-cost housing is for house density medium low, medium, and high.

Table 04. Housing needs by category house in Perak State, 1996-2000. 7th Malaysia Plan, 1996-2000

Type of House	Total	Percentage
Housing for Poor (<i>Perumahan Rakyat Miskin</i>)	1,800	3.0
Low Cost Housing (<i>Perumahan Kos Rendah</i>)	17,200	29.0
Medium Low Cost Housing (<i>Perumahan Kos Sederhana Rendah</i>)	29,000	49.0
Medium Cost Housing (<i>Perumahan Kos Sederhana</i>)	8,000	14.0
High Cost Housing (<i>Perumahan Kos Tinggi</i>)	3,000	5.0
Total	59,000	100.0

6.2. Dimensions of Land Use

Table 05. General Site Development Characteristics

Categories	Data from Case Study (Pangkor land use data 2015)
Undeveloped land	160.81 hectares/ 7.66 percent (Vacant land)
Undeveloped land, otherwise used	
Developed land without structure	217.02 hectares/ 10.33 percent (Potential Area/ Land)
Developed land with permanent non-building structure	28.67 hectares/ 1.36 percent (Recreation) 10.01 hectares/ 0.48 percent (Beach) 1522.67 hectares/ 72.49 percent (Reserve forest)
Developed land with permanent building	157.68 hectares/ 7.50 percent (Housing) 92.72 hectares/ 4.41 percent (Business and Services) 0.82 hectares/ 0.04 (Industry)

Source. Federal Department of Town and Country Planning Peninsular Malaysia

Site Adaptation: Building Type - General Site Development identifies structures on a piece of land, whereas the type of building explains the structure in detail. According to Albert, it helps to identify:

- Available quantity of internal space;
- Utility provide by the particular structure;
- Total land occupied; and
- Value i.e. assessed value and value per square foot.

Table 06. List of infrastructure facilities on Pangkor Island

Transport facility	<ul style="list-style-type: none"> • Air – airplane • Water – Ferry and bot for tourism • Land – Taxi (van), car rental, motorbike rental and mountain bicycle by chalet/ hotel.
Booth	<ul style="list-style-type: none"> • Food booth • Souvenir booth
Accommodation	<ul style="list-style-type: none"> • Chalet and hotel
Government department, private and public agencies	<ul style="list-style-type: none"> • Headman office • Fire station • Police station • Public work department • Office of national fisherman association Pangkor • Perak Water Board • Electric Supply Agencies: Tenaga Nasional Berhad • Telecommunication: Telekom Malaysia Berhad • Pan Silver Ferry Transport Company, Duta Pangkor Sdn. Bhd. and Mesra • Teluk Raja Bayang Taxi Transport Company

Library	<ul style="list-style-type: none"> • Pangkor public library • 1 Malaysia Information Centre
School	<ul style="list-style-type: none"> • Secondary school • Primary school (type) Chinese/ Indian
Places of worship	<ul style="list-style-type: none"> • Mosques • Prayer room • Temple • Kuil
Hall	<ul style="list-style-type: none"> • Community hall • Multiple use hall

Actual Use – The type of building type tells the objectives and activities carried out in the building. For example, a house is built for residential purpose, schools are built for educational activities, offices are used for business purposes, and etc. Each building has an actual and core purpose or that need to practice in daily life. However, the type of building is not limited to the actual activity. For example, a residential building can also be used as a place to sell goods produced from home. By comparing the actual use of building and we can identify any community inhabit unsuitable or makeshift space.

Economic “over-use” – Every activity which takes place on the land is carried on as part of an enterprise of some kind (Albert, 1959). An enterprise producing and distributing goods or services, is carrying out an economic activity. Economic functions that run on top of a land are classified as economic “over-use”. Pangkor Island is a tourist island that is constantly growing since 1990 and many side effects are brought about by this growth. The tourism sector is a major economic sector in Pangkor Island, followed by the transportation sector, which have continuously attracted tourists. In addition, activities such as fisheries and selling sea products is an important revenue-generating activities for islanders who are involved in the fishing and business industry.

Activity characteristics – Considering the size, range, rhythm, and material effect on human senses, characteristics of activity at each site or structure will affect human. They are therefore the substance of many planning concerns having to do with the arrangement of activity on land, including zoning, neighbourhood planning, transportation planning, etc. (Albert, 1959). The major subjects of the fifth and final classification to be considered here are:

- Size of activity, represented by the volume of people joining the activity daily or weekly;
- Rhythm or time-shape, i.e., the typical variation of size in the course of a day or a longer period of time;
- Realm or range of influence of the activity, such as neighbourhood, citywide, regional, etc.;
- Material effects on senses, such as noise, odour, vibration, etc.

Table 7. below is the general format for land use classification. It shows all dimensions of land use with reference to some examples of types of land use on Pangkor Island.

Table 07. General format for multiple land use classification

	General site development characteristics	Site adaptation: building type	Actual use	Economic over-use
Recreation park	Develop, non-building structure	Recreation and sports	Recreation and sports activities	Services
Pedestrian road	Develop, non-building structure	Road	Walking routes	Services
Seafood products factory	Develop, permanent building	Industrial building	Industrial activities	Manufacturing/ production
Ferry terminal	Develop, permanent building	Transportation	Transport activities	Services
School	Develop, permanent building	Education	Educational activities	Services
Vacant land	Undeveloped, unused	————	————	————
	Activity characteristics			
	Traffic	Time-shape	Realm	Material effect
Recreation park	Low	Day/ week	Town	Limited effect
Seafood products factory	Medium	Day/ week	Region	Noise, air, water
Ferry terminal	High	Day/ week	Region	Air, water
Vacant land	————	————	————	————

7. Conclusion

For future planning on a limited island, efficient and effective governance is indispensable. Good governance is an essential element in the any present administrative body. Good land use governance is expected to make a major contribution to the realization of sustainable development. It can facilitate the allocation of land to the uses that provide the greatest sustainable benefits. This demands that development remains within the carrying capacity of supporting ecosystems. By examining all uses of land in an integrated manner, it makes it possible to build consensus and minimise conflicts through informed negotiations among competing uses, to make the most efficient trade-offs and link social and economic development with environmental protection and enhancement, thus helping to achieve the objectives of sustainable development.

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