TOWARDS DEVELOPING A THREE-DIMENSIONAL CADASTRE FOR THREE-DIMENSIONAL PROPERTY RIGHTS IN MALAYSIA

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To my beloved father (Tan Liang Kooi), mother (Phang Wah Eng)
wife (Ng Ai Li), daughters (Tan Jing Rou and Tan Jing Yu)
brothers and family in law

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ABSTRACT

Like many countries, Malaysia does not have enough vacant land to cater for rapid development. Hence developers have started to build below the ground surface and above it, especially in areas where land values are at a premium. This study was undertaken to examine the rights of landowner with regard to on-surface, above-surface and below-surface properties as provided for by the National Land Code 1965 (Act 56), Strata Titles Act 1985 (Act 318), the Building and Common Property (Maintenance and Management) Act 2007 (Act 663), Certified Plan, Document of Title and Swedish Cadastral Procedure Acts. This study also examined how rights are registered in the cadastre. The methodology adopted involving theoretical and empirical study. A semi-structure and descriptive approach was adopted in the questionnaire survey. In addition, the cadastral methods, procedures and related legislation in force in Malaysia were compared with the corresponding practices in Sweden. Malaysian cadastral professionals generally felt that the legal changes in the land registries in Malaysia had not kept pace with the changing trends in urban development, and there were still difficulties in registering the ownership of properties that were created on, above or below the ground surface. The findings from the study found that the current land related legislation in force in Malaysia has not provided an adequate legal structure. Therefore, suggestions have been made to amend the legislations in these land related legal documents. Finally, the effectiveness of the land administration system, land registration system, land information system and cadastre system can be significantly improved through these amendments.

ABSTRAK

Kebanyakan negara termasuk Malaysia, kekurangan tanah kosong di permukaan bumi untuk menampung kepesatan pembangunan. Dengan itu, pemaju perumahan telah mula memajukan ruang bawah tanah dan ruang udara. Oleh yang demikian, kajian ini mengkaji hak-hak pemilik hartanah di permukaan, atas permukaan dan bawah permukaan bumi sebagaimana diperuntukkan dalam Kanun Tanah Negara 1965 (Akta 56), Akta Hak Milik Strata 1985 (Akta 318), Akta Bangunan dan Harta Bersama (Penyenggaraan dan Pengurusan) 2007 (Akta 663), Pelan Akui, Dokumen Hakmilik dan Akta Prosedur Kadaster Sweden serta mengkaji bagaimana hak tersebut dapat didaftarkan dalam ukuran kadaster. Metodologi yang diguna pakai melibatkan kajian teori dan empirik. Ia menggunakan kaedah struktur separa dan deskriptif dalam kajian soal selidik. Di samping itu, kaedah dan prosedur serta undang-undang berkaitan dengan ukuran kadaster yang berkuatkuasa di Malaysia juga telah dibanding dengan Sweden. Para profesional berpendapat bahawa perubahan undang-undang di pejabat pendaftar tidak mengikut perubahan semasa pembangunan bandar dan masih sukar mendaftar pemilikan harta tanah yang telah wujud pada, atas atau di bawah permukaan bumi. Hasil kajian telah mendapati bahawa undang-undang tanah yang berkuatkuasa di Malaysia sekarang belum lagi menyediakan satu struktur undang-undang yang mantap. Oleh yang demikian, cadangan telah dibuat untuk meminda undang-undang dalam dokumen berkaitan tanah tersebut. Akhirnya, dengan pindaan tersebut, keberkesanan sistem pentadbiran tanah, sistem pendaftaran tanah, sistem maklumat tanah dan sistem kadaster dapat meningkat dengan ketara.

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CHAPTER 1

INTRODUCTION

1.1 Background

One of the important global issues with regard to property is the scarcity of vacant land for development. Many countries, including Malaysia, do not have enough vacant land on the ground surface to cater for rapid development. Forrai and Kirschner (2002) observe that the availability of land for future and further construction would be limited, and whatever is available would be expensive. This is particularly true in big cities that see increasing numbers of mixed settlements amidst modern skyscrapers. As the demand and competition for space on the land surface intensify, the three-dimensional aspect in property formation assumes increasing importance. In recent times, this three-dimensional aspect plays a significant role in determining the rights of Malaysian property owners through legislation, especially in areas with multi-level mixed development. The so-called three-dimensional (3D) properties that encompass skyscrapers and other multi-level developments in urban areas are often regarded as a special category of property, distinct from the traditional properties. Nevertheless, in Malaysia and many other countries, these two types of properties have been integrated within the same legislation. Examples of such property units include properties above surface, such as constructions on top of one other, overhead infrastructures and utilities involving the use of air space, property

on surface, such as multi-storey buildings and landed properties in gated and guarded communities, and properties below the ground surface, such as underground infrastructures and utilities.

The term 3D property right is difficult to define because it lacks a universally accepted meaning. The concept of a 3D property right may vary, depending on the legislation and the country where it is used. Along with this ambiguity, the rights held by the specified properties - be they public rights, common rights, management rights and private rights - are similarly equivocal. Since there is no clear and commonly accepted lexical definition of 3D property right, I have chosen a definition for my thesis. I try to keep it as comprehensive and general as possible to encompass different forms of property rights. Thus, my definition of 3D property right is *RIGHTS WITH DIMENSIONS ON SURFACE AND DIMENSIONS ABOVE SURFACE AND/OR DIMENSIONS BELOW SURFACE THAT IS IN SEPARATE (INDEPENDENT) TITLES.*

1.2 Problem Areas

In the last couple of decades, there has been an increasing demand for property development in urban areas, resulting in the division of property ownership so that different owners can own a delimited space on, above or below ground surface. When multiple uses of space above surface was started by high rise constructions and aviation, it brought forth the question whether such space could be subdivided into separate units for individual ownership (Sandberg, 2003). Thus a situation has emerged where the dimensions above and below the ground surface, besides those on the ground, are important considerations in property ownership.

Putting utilities features, such as electrical cable and water pipeline under the ground surface is a good way of saving the surface on the ground for other attractive land use. Multi-layer developments have also been necessary due to railway stations

occupying extremely large areas in city centres. Such constructions above and below traffic routes are a phenomenon that first started in large cities in the United States (Sandberg, 2003).

Development above and below the ground surface can be facilitated by guaranteeing the property rights of owners. It is also believed that the registration of rights in 3D properties promotes investment in such development projects (Doytsher, Forrai and Kirschner, 2001). Investors often show interest in using the land above and below ground in urban areas, but they seek better protection and security for property rights and want to have such rights transferable (Paulsson, 2007). Other factors that contribute to the increased interests of investors in constructions below or above the surface include greater demand of building sites in metropolitan areas, higher land prices, new construction techniques and architectural trends as well as enhanced and cheaper methods for drilling in rocks. This has in turn led to a demand from the market for the financing of such constructions (Onsrud, 2003).

Again, according to Paulsson (2007), several parties can simultaneously use one parcel, with rights limited to the one dimension. It is possible to register 3D property rights for different types of facilities, both below and above ground surface. An example is a building divided into many individual parcels above the public road.

Numerous situations can potentially give rise to disputes in property rights in the modern three-dimensional environment. For instance, in the mixed development of a service apartment, questions of ownership are likely to arise where some parts of a building are used for commercial activities and other parts of the same building are used for residential purposes. As another example, a grant may be given for the construction of an office block above the tracks of a railway line (Stoter, 2004). In addition, the use of underground surface for different types of activities that have no relation to land use on or above the ground surface will complicate matters further. Underground space is often used for access and support, mining, infrastructure systems, such as cables, water and drainage, and transport, parking space, railway and roads (Sandberg, 2003).

Again, where several private and public properties are closely interconnected within the same building, it is important that clear rules exist on the rights between neighbours in order to gain access for the purpose of maintenance, repair and building work (Paulsson, 2007). The examples are creations of common property, right of way or easement. Access to these properties from the ground level must be resolved and the ownership and management of facilities that are not included in the apartment units, as well as the building structure and spaces between them, must be clarified. Hence, it is important to regulate ownership rights of such properties by an adequate cadastre law. These matters are not always resolved completely by existing laws, and must be treated differently from case to case in the cadastral procedure.

There are currently many arguments about the surface under different categories of land use, subdivision, partition and amalgamation. The rights are defined but not illustrated in the cadastre system. These arguments would evidently be different if 3D property rights are used. Since there are inadequate special provisions in cadastre system for 3D property rights, other legal rights have to be used to allow separate parties to have access to different parts of one building or property. Such rights invoked include easements, common property, joint property or joint ownership with an individual right to use a specific part of the property. However, each of these forms has certain disadvantages and limitations. The need for numerous uses of space and access to three dimensionally defined spaces in general is not resolved satisfactorily with only the traditional definition of property. Therefore, it is important to have in place well-defined ownership rights to three dimensionally defined spaces. Amendments and new legislation have to be passed to create rights for owners of three-dimensional propertied and air rights (Sandberg, 2003). Again, 3D property rights can take on different forms and can vary from full ownership to rights of different extents (Paulsson, 2007).

Some common law jurisdictions have legislation permitting air space rights above ground level in forms ranging from an absolute conveyance to splitting off individual rights associated with the air space parcel. Such legislation is often used in a complicated town development in large multi-layer construction projects. It can be said that the legislation found in common law legal system in some countries allows for a vertical division of space, with one party owning the strata structure,

another one owning the land surface, and yet another owning the air rights. However, for the civil law system in some countries, this is trickier due to a stricter adherence, where the owner of the land has ownership that also extends unlimited into the sky and down into the earth. This traditional doctrine was established at a time when there was little use for subsurface space (Sandberg, 2003) and space above surface.

1.2.1 Problem Statement

In Malaysia, public road (State roads and Municipal roads) belong to the State government while public road (federal roads) belong to the federal government. Generally, a good road system is beneficial; it increases security, reduces infrastructure costs and increases the number of housing units in a comfortable residential environment. When a private property is constructed above a public road, it is difficult for the cadastral system to recognise two or more different owners at the same time in the present legislations.

According to Section 5 of National Land Code 1965, land includes the surface of the earth and all substances forming that surface; the earth below the surface and all substances therein; all things attached to the earth or permanently fastened to anything attached to the earth, whether on or below the surface; and land covered by water. Meanwhile, Section 75A to 75G deals with permit to use air space above State land and reserved land. In addition, Section 92A of National Land Code 1965 describes underground land as land that lies below the surface and stratum as a cubic layer of underground land. Meanwhile, Section 6 of Strata Titles Act 1985 defines any building or alienated land having two or more storeys or buildings held on one lot (as master lot) under final title shall be capable of being subdivided into parcels or land parcels, however, this only happen in strata scheme. For non-strata scheme, it is difficult to register stratify dimension for properties above public road, this is because public road does not consider as a lot under current Malaysian Cadastre System. Therefore, no lot number is given and no Document of Title is

issued for public road. Due to that reason, no grant will be alienated to non-title lot or non-strata lot.

All owners of the strata title units have rights in the surface of the land but there is no provision for having strata titles without having rights to the surface land. It depends on the surface. Although the law may allow sharing the air space above public road but that only permits for a period of 21 years and this provision is not have business profit for development. The total separation of title or so-called separately of (independent) title is missing in Malaysia. If we make the rights on surface, above surface and below surface separated from each other, the law may be conducive to future development.

It is important to note that the concept of 3D property hinges on the legal system that is in place. Each legal system has its own instruments for multiple use of the land. The main issue here is not only how to define 3D property, but also what kind of term and definition to use for this concept. Many publications in the literature use both 3D property and 3D cadastre to describe this concept. 3D cadastre (Stoter, 2004) seems to be more widely used internationally, although its emphasis is often on technical issues, whereas 3D property is more closely associated with legal issues (Reshetyuk, 2004). In order to describe this research legally, the term '3D property' rather than '3D cadastre' is used here.

1.3 Research Questions

There are many aspects to consider in developing a multipurpose 3D cadastre for 3D property rights in Malaysia. Among these aspects, the focus of this research was the question of whether there was a need for separate rights in 3D property to be introduced in Malaysia. The problems in the Malaysian cadastral system, from the legal perspective, would serve as a foundation for 3D property and its technical aspects. Due to inadequate illustration of separate rights in 3D property in the land

and cadastral legislation, such properties do not receive full recognition and protection. As a result, it is necessary to look into the legal systems of other countries, where total separation of title is already legally endorsed.

It is important to gather as much information as possible about various 3D property rights from the legal aspect in order to address the problems that might arise. It is also crucial to state the kinds of rights to be recorded in the new cadastre for 3D property, how the information on the regulation and practice of 3D property rights is collated to highlight their specific features. Such information is useful for a better understanding of the problems that may occur in countries introducing 3D property rights into their legislation.

Hence, the principal research questions on which this study is based include the following:

1) Do existing rights in Malaysia provide sufficient recognition to properties on surface, above surface and below surface?

2) If not, is there a need for new legislation in this connection?

3) What aspects of regulation need to be revised to cater to the specific characteristics of separate rights in 3D property?

4) What might Malaysia learn from the experiences in 3D cadastre as practised in other countries, in terms of implementation and legalities?

The hypothesis is that - *is the law in Malaysia adequate for recognizing separate (independent) titles to airspace, surface and subsurface.*

1.4 Research Aim

The main aim of this study is to investigate how separate (independent) titles could be issued to airspace, surface and subsurface properties.

1.5 Objectives of the Research

In line with the problem statements, the separately of title between the right to above surface, right on surface and right to below surface, the main task of this research is to reformulate, further improve and enhance the usefulness of the existing cadastral system and title registration system of 3D properties. To realise this, the objectives of this research are:

a) To examine the rights of landowner in on surface properties, above surface properties and below surface properties as provided by the National Land Code 1965 (Act 56), Strata Titles Act 1985 (Act 318), the Building and Common Property (Maintenance and Management) Act 2007 (Act 663), Certified Plan and Document of Title, and how do rights are registered in the cadastre.

b) To examine the rights of landowner in on surface properties, above surface properties and below surface properties as provided by the Swedish Land Code and Cadastral Procedure Acts, and how do rights are registered in the cadastre.

1.6 Research Methodology

Research methodology is vital to ensure that the objectives of the study would be achieved in a proper and structured way. Correct research methodology avoids deviation from the objectives and gives a clearer understanding on how the study is to be carried out.

The terms *act*, *law*, *code* and *statute* are used throughout this thesis almost interchangeably. Different legal systems use different terms, which may vary in different countries. It should be pointed out that no particular difference in meaning is intended among these specific terms. 3D property rights, 3D cadastre and other cadastre systems were examined in this study. Laws concerning 3D property rights in Malaysia and Sweden were studied and compared, utilising both primary and secondary sources.

Theoretical studies have always been a very important method and inexpensive activity in scientific research. It is used to gain a basic understanding of physical processes, where comparative research has historically played a significant role in their development as scientific disciplines. Here, the concept of comparison implies that any comparison is a comparison between two objects. Within a single comparison, there are only two objects to be compared at the same time; a comparison of multiple objects is actually a combination of several single comparisons. Each time a comparison is made, it must be restricted to the common domain in the specific range, and the two objects compared must belong to the same field. The common standard must be defined in a one-time comparison. Therefore, the objects, the common domain and common standard must be regarded as pre-existing in one comparison. In addition, content analysis is a scholarly methodology in the social sciences for studying the content of communication.

There were two stages of the research. The first stage involved theoretical study of primary and secondary sources of law and literature review (books, journals, articles, theses etc.) respectively. The second stage was concerned with empirical study. Empirical study is defined as research based on observed and measured

phenomena. It is a way of gaining knowledge based on actual observations or experiments using quantitative research methods and it may generate numerical data between two or more variables. Through quantifying the evidence, a researcher can answer empirical questions, which should be clearly defined and answerable with the evidence collected. This empirical study involved the development of a few open-ended and majority of close-ended questionnaire survey based on information related to on surface, above surface and below surface that obtained from the statutes documents in the first stage to measure the opinion and awareness of practitioners.

In the first stage of the research by theoretical study, attention was focussed on content analyses of sources comprising the comparison of contents from three types of local statutes, i.e. National Land Code 1965 (Act 56), Strata Titles Act 1985 (Act 318) as well as the Building and Common Property (Maintenance and Management) Act 2007 (Act 663), and two types of Swedish statutes, i.e. Swedish Land Code and Cadastral Procedure Acts. These legislations were used to compare and benchmark the current property rights in Malaysia. The chapter involved in this stage are Chapter Two to Chapter Five.

In the second stage of the research by empirical study, a semi-structured and descriptive approach was adopted in the questionnaire survey. The feedback gathered enabled the comparison of the collective perceptions of personnel from various government authorities and professional firms. The respondents were asked about their knowledge, familiarity and opinions on the current Malaysian land law and cadastral system, including the 3D cadastre system. Their opinions were sought on existing problems associated with the Malaysian Cadastre System and how such shortcomings might be addressed. The answers obtained were used to gauge the relevance and importance of these matters from the perspective of the different stakeholders regarding 3D property rights. Also evaluated were their views on recommendations for changes, if necessary, of the Malaysian cadastre laws. To verify the study, validation support from licensed land surveyors and other related practitioners had been carried out after the empirical study. The chapter involved in this stage is Chapter Six.

1.7 Scope of the Research

This research appraised multipurpose 3D cadastre for 3D property rights in mixed development areas by using the existing cadastre legislation framework, without carrying out any new technical development. The focus of my research was on these two frameworks, namely 3D property rights and 3D cadastre. 3D property encompasses independent 3D property and condominium. Meanwhile, 3D cadastre is a cadastre that registers and illustrates the rights on parcels and 3D property units.

The area of research for this study took into account several considerations. Firstly, the research focused on mainly these three types of statutes documents, namely the National Land Code 1965 (Act 56), Strata Titles Act 1985 (Act 318), and the Building and Common Property (Maintenance and Management) Act 2007 (Act 663). This research also focused on the underground land and the statutes document involved are the National Land Code (Underground Land) (Minimum Depth) Regulations 2006 and guidelines on stratum by Department of Director General of Lands and Mines (JKPTG), such as Guideline for the Implementation of Disposal of Underground Land under National Land Code 1965. These legislations were chosen because they recognize the 3D land rights.

Secondly, this research focused on only certain departments, namely the State District Land Office, State Local Authority, Department of Director General of Lands and Mines, State Land and Mines Office, Department of Survey and Mapping Malaysia. In addition, selected licensed Land Surveyors from Penang, Selangor, Kuala Lumpur / Putrajaya and Johore also participated in the study. All the respondents to the questionnaires were directly involved in the registration, cadastral survey and processing for multi-layer properties. In addition, questionnaires were also given to selected senior personnel in relevant regulatory authorities and companies.

1.8 Significance of the Research

In Malaysian land and cadastre legislation, a land or lot is defined as the surface of the earth and all substance forming that surface and the earth below the surface and all substances (National Land Code 1965, 2010). As a result, the lot has become the basic unit in Malaysian cadastral survey and mapping and land registry. Lots and land parcels adjudicative aspect consists of two parts: firstly, the ascertaining of the physical surface boundaries by land survey boundary markers and secondly, the official ascertainment of rights in the land via registration and issue of Document of Title. Hence, the proprietor of the lot, together with the air space and the underground land that is attached, will continue to enjoy the rights to affect dealing, subdivision, partition, amalgamation and even subdivision of building if allowed by the State authority (Chong, 2006). In order to make these rights practicable for the proprietor, certain current laws and legal clauses, statements in certain codes and acts have to be changed, added, or cancelled if necessary.

As stratified properties, especially in mixed multi-level developments, have become common, the legal basis of the land and strata title arrangement is well tested. However, there is room for more critical research on the problematic areas of land and strata title development in Malaysia. Most studies focus only on the technical aspects of the three-dimensional registration rather than the legal aspects. Exceptions here are the studies by Chong (2006) on the legal and organisational aspects in this regard. The current research will examine and address some of the most problematic issues concerning the future development of multi-level buildings in a mixed development.

1.9 Research Contribution

It is hoped that this study will provide a better understanding of the nature of 3D property rights, besides adding new information to the available literature in the field. I envisage the main contributions of this study to the present knowledge to be in the following areas:

a) Cadastral survey and mapping, and land registration practices in the Malaysian Cadastre System.

b) Formal definition of 3D property rights for multi-layer buildings in mixed developments.

c) Basic recommendations for the structuring and implementation of the 3D cadastre system from the legislative and technical viewpoints.

d) Increased revenue collection by State Local Authorities from assessment and quit rent payments.

Moreover, the findings and contributions of this thesis would be useful to decision-makers from various government authorities related to property registration and land use, professionals in the industry and housing developers in Malaysia.

1.10 Structure of the Study

This study is divided into eight chapters. Chapter One, the Introduction, gives an outline of the study and the way the research is organised and presented for the rest of this paper. In Chapter One, the problem statement is presented, followed by the research questions, the objectives of the study and a brief explanation on

research methodology. In addition, the scope of the study is presented, as well as the significance and contribution of the research.

Chapter Two covers an overview of 3D property. The discussion includes the definition and rights related to properties and 3D properties. The objective of the chapter is to collate an understanding, from related literature, of the concepts, philosophy as well as theory of property rights.

Chapter Three is solely concerned with the theoretical aspects of the study, particularly land, land administration system, land registration system, land information system, cadastre system and the future cadastre. It covers the definitions, history and components of each concept related to properties. The input for this chapter is based on relevant information in high impact journals, reference books, theses, newspaper cuttings and other academic materials.

Chapter Four explains the land tenure before and after the National Land Code 1965. It highlights the legal framework for 3D property and types of rights in land related legal documents, namely the National Land Code 1965 (Act 56), Strata Titles Act 1985 (Act 318), the Building and Common Property (Maintenance and Management) Act 2007 (Act 663), Document of Title and Certified Plan. It covers the theory and framework of the Malaysian Cadastre System. This chapter also explains good governance involved in land administration and cadastre.

Chapter Five describes the 3D property status in Sweden. The backgrounds of previous and current cadastral systems of 3D property in Sweden are examined. The chapter also covers Swedish Land and Cadastral Legislation. Finally, there is a description and evaluation of the legal framework and boundary on 3D properties in Sweden.

Chapter Six examines the 3D cadastre in the context of the Malaysian perspective. Based on the information gathered from secondary sources, a specially designed questionnaire was used in a survey to collect the data required for this study. The results and the implications of the findings are discussed to give an overall perspective of how cadastral professionals in Malaysia view the current 3D

cadastre situation. Also presented here are their viewpoints regarding what they consider to be the essential changes that are required to standardize cadastral registration and to streamline its administration and enforcement in the country.

Chapter Seven presents the similarities and differences between the countries of comparison (Malaysia and Sweden). It gives the summary of comparison at the end of the chapter.

Chapter Eight gives recommendations for amendments related to 3D property rights, whether above, on or below the ground surface in Malaysia, which involve the National Land Code 1965 (Act 56), the Strata Titles Act 1985 (Act 318), the Building and Common Property (Maintenance and Management) Act 2007 (Act 663), the Certified Plan and the Document of Title. Finally, this chapter also gives suggestions on data information integration and recommendations for further research.

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Three-dimensional objects may be produced by depositing repeated layers of solidifying material until the shape is formed. Any material, such as self-hardening waxes, thermoplastic resins, molten metals, two-part epoxies, foaming plastics, and glass, which adheres to the previous layer with an adequate bond upon solidification, may be utilized.Â This invention relates to an apparatus and process for forming a three-dimensional object of predetermined design, and in particular to the making of a model or article by depositing multiple layers of a material in a fluid state onto a base. The material is selected and its temperature is controlled so that it solidifies substantially instantaneously upon extrusion or dispensing onto a base, with the build-up of the multiple layers forming the desired article. A 3D Cadastre application prototype was developed to visualize the existing state of a part of Tehran and to perform simulations of district development plan. In this application, a highresolution 3D city model is introduced and integrated with the 2D urban planning database.Â Designing three dimensional property right database for Turkey. African Journal of Business Management Vol. 5(22), pp. 9440-9447, 30 September, 2011 Available online at http://www.academicjournals.org/ajbm ISSN 1993-8233 2011 Academic Journals Full Length Research.Â LADM Implementation Prototype for 3D Cadastre Information System of Multi-Level Apartment in Indonesia Yanto BUDISUSANTO, Trias ADITYA and Rochmad MURYAMTO, Indonesia Key words: LADM, 3D Casdastre, UML.