

CHAPTER 6

3D CADASTRE AND THE MALAYSIAN PERSPECTIVE- AN EMPIRICAL STUDY

6.1 Introduction

With the 3D cadastre being a relatively new concept in Malaysia, a survey using questionnaires was undertaken to appraise the perception, understanding and opinions held by Malaysian cadastre professionals (mainly land administrators and land surveyors) on 3D property in the country. The questionnaires were aimed at soliciting information regarding the respondents' perceptions of the current status of 3D cadastre, the strengths and weaknesses of existing regulations governing 3D cadastre and changes in the law that are required to implement such regulations effectively. The main findings from these surveys are described in this section.

6.2 The Questionnaire Survey

A questionnaire survey was undertaken to appraise the collective perceptions of personnel from various government authorities and professional firms on 3D cadastre for 3D property in Malaysia. The questions concerned land administration, planning and valuation by the State Land and Mines Office, State District Land Office, the Department of Director General of Lands and Mines and the State Local Authority. There were also questions for surveyors from the Department of Survey and Mapping Malaysia and licensed land surveyors from Penang, Selangor, Federal Territories of Kuala Lumpur and Putrajaya as well as Johore.

Questions were posed to respondents about their knowledge, familiarity and opinions on the Malaysian land law and cadastre system in general, and the 3D cadastre system in particular. The views of the respondents were sought on the current problems associated with the Malaysian cadastre system and how such shortcomings might be dealt with. The answers obtained from the questionnaires were used to appraise the relevance and importance of these issues from the perspective of different stakeholders. Also evaluated were their views on recommendations for changes, if necessary, of the Strata Titles Act 1985 (Act 318), the National Land Code 1965 (Act 56) and the Building and Common Property (Maintenance and Management) Act 2007 (Act 663) that would facilitate the Malaysian land law and Malaysian cadastre system practices.

All the selected respondents whom based on working experience in the study were from the public and private sectors who were directly involved in the management of land and multilayer ownership properties. There was more focus on Penang, Selangor, Federal Territory of Kuala Lumpur/Putrajaya and Johore because these States had the most number of multi-layer properties in Malaysia at the time of writing.

The questionnaire consisted of five parts. Part A was aimed at gathering information about the demography of the respondents. However, the information from this part was used only as reference and was not analysed further. Part B aimed

at collecting the views of respondents concerning the significance of current Malaysian land legislation. In Part C, the views of the respondents about the suitability of current land administration in Malaysia were collected. Only the respondents from State Land and Mines Office, State District Land Office, Department of Director General of Lands and Mines and State Local Authority were required to respond to the questions from Part B and Part C. Part D and Part E examined the level of understanding by land surveyors from the Department of Survey and Mapping Malaysia and private licensed land surveyor firms in cadastre registration and cadastral survey and mapping issues respectively. The participating land surveyors were required to answer all the questions.

Out of the 114 questionnaires that were distributed, 110 (96.5%) were returned; 106 (96.4%) were valid for use. Of the responses received from the State District Land Office (PTD), State Local Authority (PBT), Department of Director General of Lands and Mines (JKPTG) and State Land and Mines Office (PTG), 61 questionnaires were valid. A total of 45 valid questionnaires were received from the Department of Survey and Mapping Malaysia (DSMM) and licensed land surveyor (LLS). Figure 6.1 shows the number of questionnaires distributed, received and considered valid for analysis.

Data obtained from the questionnaires were expressed as percentages to make the findings more meaningful. The results were analysed from the static and dynamic perspectives. It was static in the sense that it considered the legal systems for 3D property rights with the rules and legislation currently in force. At the same time, a dynamic analysis of the results was carried out by examining historical legal changes, and the convergence of these systems through time. The survey questionnaires are shown in Appendix C1. The salient findings from the questionnaires are summarised and discussed in subsections below.

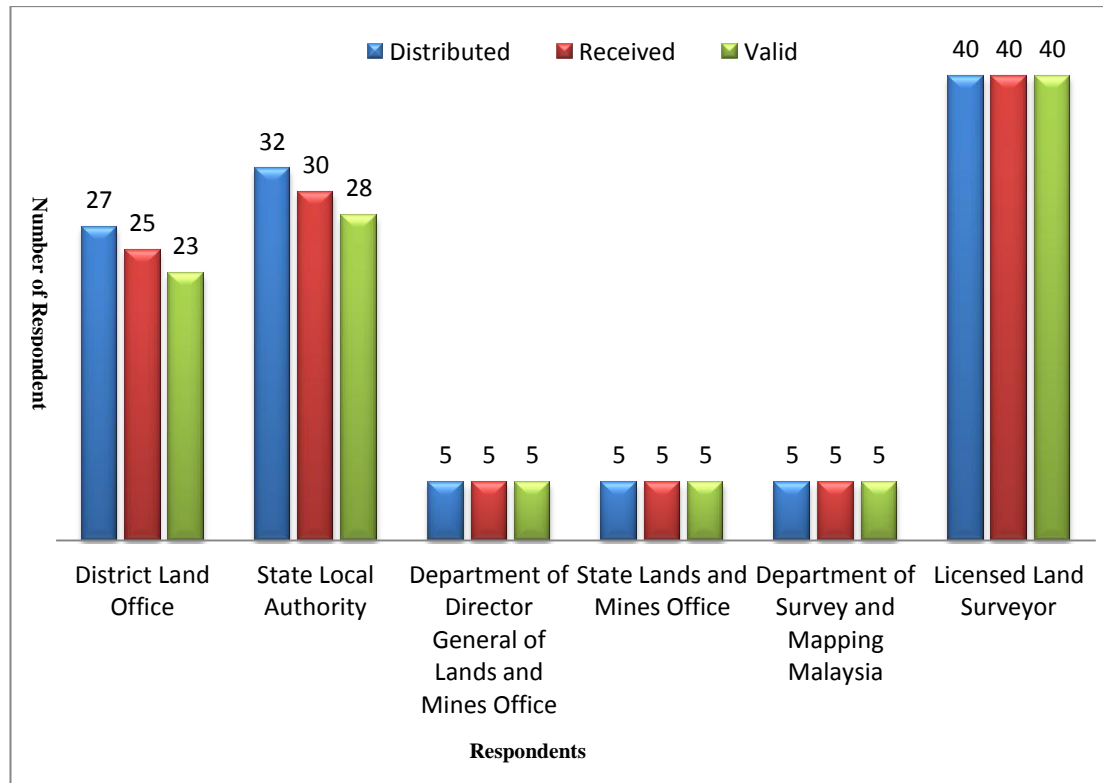


Figure 6.1: Questionnaires distributed, received and considered valid for analysis

6.3 Perception of 3D Cadastre for 3D Property in Relation to Land Administration and Cadastre

Listed below are various perceptions of 3D cadastre for 3D property in relation to land administration and cadastre *viz.* dimension on surface, above surface and below surface, 3D property, registration, institutional as well as cadastral survey and mapping.

6.3.1 Dimension On Surface, Above Surface and Below Surface

There are three common cases in the situation of overlapping properties above, on and below ground surface. That such a situation exists in many Malaysian cities is reflected in the feedback from a questionnaire in which 47% out of 106 respondents agreed and 15% respondents strongly agreed that in Malaysian real estate, buildings had often been built on top of one another, or they crossed boundary edges. The first is air space parcel, e.g. sky bridges, balconies, bay windows, and public transportation and utility networks above reserved roads, such as the monorail, light rail transit rail track and their station as well as transmission lines. The second is on-surface construction property, e.g. mixed development schemes under the Strata Titles Act 1985 (Act 318) that mixes shop houses located at lower levels and residential units at higher levels. There is finally sub-surface construction property, e.g. public transportation and utilities network constructed below road reserves such as the monorail, the rail track of the light rail transit and their stations as well as pile lines.

In the survey done, a high proportion of respondents, 69.8% either agreed or strongly agreed that the existing laws and guidelines for stratum under Part Five (A) of the National Land Code 1965 (Act 56), Disposal of Underground Land, Section 92A to 92I could be used as a basis for 3D property volumetric land parcel alienation for dimension above the ground surface. Twenty-four percent of the respondents remained uncommitted on this issue. However, there were also 6.6% of the respondents who either disagreed or strongly disagreed on this matter. In addition, the Strata Titles Act 1985 (Act 318) allows land to be subdivided into parcels or land parcels based on the area occupied. Moreover, the National Land Code 1965 (Act 56) allows air space rights above ground surface up to a maximum of 21 years in form ranging from an absolute conveyance to splitting off individual rights associated with the air space parcel.

There were mixed perceptions among Malaysian cadastre professionals when asked whether the country had a 3D cadastre system in place. More than half (58%), of the respondents felt that there were no government regulations in place for the 3D

property legislation while one third remained unsure. For this reason, a large proportion (84%) of the respondents were in agreement that new laws should be passed to put 3D property rights on a more sound legal footing. This is because in a cadastre system, the subdivision/partition of the surface into individual property units, and amalgamation of many individual property units surface into one surface was originally applied only to on surface boundaries. However, the use of a property would be impossible if the rights of ownership were applied only to the actual land surface, with the vertical dimensions above ground surface and dimension below ground surface excluded. Therefore, ownership rights are often not limited to the ground surface, but theoretically extended from the centre of the earth to the infinite sky (Stoter, 2004). This is still the case in many countries, even though property rights can be restricted in the vertical dimension by other rights, such as mineral and flying rights (Stoter, 2004). There is no acceptable agreement on the limits to the height and depth from the land surface within which individual property rights can be enforced.

Owing to the above-mentioned reasons, ownership rights of 3D properties can be easily infringed upon, resulting in dissension and legal issues. These problems associated with 3D properties, such as separate (independent) titles can only be resolved through suitable legal and technical approaches, thereby underlining the pressing need for comprehensive legal and technical solutions for 3D properties. Based on survey findings, slightly more than half of the respondents were dissatisfied with the Strata Titles Act 1985 (Act 318) and National Land Code 1965 (Act 56) regarding 3D property, while only 17% expressed satisfaction on this issue. It is clear from the questionnaire responses, therefore, that changes or additions to existing legislation are required to address the weaknesses of the current laws to deal with 3D cadastre.

Initially, the laws governing land and property drawn up many years ago may not accommodate current trends in building, especially in connection with 3D cadastre. There are issues pertaining to the cadastral map, the traditional paper-based and digital method of Certified Plan and Document of Title, as they are no longer legally and technically adequate. A case in point is where storeys with different heights are represented as identical flat plans in multi-storey mixed developments.

This is a clear example where the traditional cadastral approach cannot illustrate the actual height of each storey or depict how each storey lies on top of the other.

Owing to the aforementioned justification, the laws to which 3D cadastre for 3D property is subjected include 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). Based on the survey feedback, 72% of the respondents were of the opinion that there was inadequate land law which embodied the right for people to hold and dispose of property in three-dimensional separately, while the rest thought that the Strata Titles Act 1985 (Act 318) provided for this. With regard to the Strata Titles Act 1985 (Act 318), the National Land Code 1965 (Act 56), and other land laws such as the Building and Common Property (Maintenance and Management) Act 2007 (Act 663), 9, 10 and 15 percent of the respondents respectively thought that the laws were overall adequate and appropriate.

In Malaysia, different rights may exist in integrated 3D property objects, hence resulting in the difficulty of any decision-making on a lot/parcel. From the survey, 90% of the respondents thought that appropriate new legislation had an important role to play in the recognition and registration of 3D property rights for Malaysia. Eighty-two percent agreed that it should be made compulsory for those obtaining new 3D property ownership to register their rights, whether on, above or below ground surface. However, not all rights are stated clearly in the register.

The cadastre system and the philosophy related to multipurpose cadastre had been evolving continuously in response to changing global and regional needs since the initial modern cadastre in the early 1980's (Harcombe, 2001). In 2000, the cadastre system was viewed as a multipurpose governmental engine that operated best when it served administrative functions in land rights and focused on delivering sustainable land management. This means that a mature multipurpose cadastre could be considered as a land administration system in itself (Enemark, 2005). Another illustration by Ting (2002) showed that the creation of a useful multipurpose cadastre could be due to evolving information technology and construction/architectural advancements. Concurrently, other key studies on the cadastre such as the ones by Benhamu and Doytsher (2003) have illustrated that the three-dimensional boundaries

and parcels in space determined by 3D cadastre are capable of serving legal and physical objectives.

6.3.2 3D Property

The cadastre system based on a three-dimensional cadastre object modelling proposed by Stoter in 2004 provided boundary certainty of multi-level objects and property ownership (Stoter, 2004). This was essentially the 3D Cadastre.

The ownership of 3D properties on surface, above surface and below surface can be public, common, management or private. The main challenge is having a precise definition of a 3D property to protect ownership rights. Hence, it is necessary to have in place a 3D cadastre system for 3D property. Within the constraints of the present land registry system, various difficulties have arisen with regard to ownership registration and other rights of properties that are located on, above or below the ground surface.

The aim of a cadastre is to survey, record and register the rights and interests to the land that the law recognises, as these rights and interests represent the legitimate relation between the rightful claimant and a certain lot of land. Therefore, without a clearly defined 3D property law, the mechanisms for acquisition, transfer, protection, restriction, creation as well as recording or registration of 3D property rights and interests are meaningless in the cadastre (Molen, 2003a).

It is widely believed that the basic land code in land administration adopted by many countries includes special legislation governing the operation of the cadastral survey and mapping, and land registration systems that address the nature of the land and real property. Land administration is aimed at ensuring an undisturbed exercise of ownership rights. Thus, the ability to fulfil this task demonstrates the extent of society's ability to formulate a legal basis for land

ownership. In this regard, legal relations must be defined precisely in land law and in other laws that are related to properties.

Based on survey findings, slightly more than half of the respondents were dissatisfied with the Strata Titles Act 1985 (Act 318) and National Land Code 1965 (Act 56) regarding 3D property, while only 17% expressed satisfaction on this issue. An overwhelming proportion (93%) of the survey respondents supported the development of a new legislation integrating 3D property rights aspects. In addition, based on the feedback from the personnel of the Department of Survey and Mapping Malaysia (DSMM) and licensed land surveyor, when asked whether the legal system recognised 3D properties, 31% answered in the affirmative whereas 20% disagreed. Nearly half of the respondents skirted the issue. There is, thus, a necessity to find a suitable cadastre solution for multi-layer constructions. There is a lack of proper legislation regarding 3D property in land and cadastre law in Malaysia to cater for the registration of any related legal and technical aspects. Many conflicts seem to exist between laws and statutes with the current cadastre status. Therefore, the rights associated with this registration should be clear in the registry titles issued. Better 3D visualization should be developed and employed.

In a survey carried out in the present study, only about one quarter of the respondents felt that the current registry in Malaysia was adequate, whereas two-thirds agreed that the current cadastre system was unable to handle the registration of 3D properties in separate (independent) title for property on, above and below surface. In the abovementioned questionnaire, 88% of the respondents agreed that there was a need for legal registration adapted for 3D property. For this reasons, new cadastre systems should be able to represent the actual property in three-dimensional (dimension on, above and below surface), and not just the parcel on the ground surface. The implication of these new ways of land use due to a high demand for ground space means that changes have to be made to the traditional paradigm to address the legal aspects. It is anticipated that in the near future a new cadastre will have a system that is complete, systematic and comprehensive. Besides containing updated documentation of public and private rights, ownership, land use and real estate in the various spaces, it should reflect the existing situation of all property rights, whether it pertains to private or public properties. Moreover, according to

Dimopoulou, Gavanas and Zuntelis (2006), this new cadastre system should provide a better-rationalised management of the built environment, including regulations, legality of use or of economic applications.

Personally, I feel that a 3D property is similar to a traditional surface property in many of its features. Just like a traditional property, a 3D property can be transferred, mortgaged, inherited and expropriated as well as be created by available cadastral procedures, such as subdivision, partition and amalgamation. The 3D property addressed in this research, however, is treated as a separate kind of property, in contrast with properties above the surface, on the surface and below the surface, in terms of legal and technical features. Hence, a specific feature of 3D properties is that they are actually sections of space located on, above or below ground surface. These spaces can lie under or above the traditional on-surface property or even another 3D property (Onsrud, 2003).

6.3.3 Registration

The survey in this study showed that only 16% of cadastre professional respondents were of the opinion that current land laws were being enforced adequately in all types of development, while 53% thought the law recognised 3D property rights in mixed developments. On the other hand, 77% and 37% of respondents respectively thought otherwise, due to lack of recognition or reflection of the third perspective in 3D cadastre, a fact that, modern urban living and land usage needs are pushing hard on the existing laws. As an example, at Kuala Lumpur Sentral, a transport hub where railroads, light rail transport systems, hotels, condominiums, car parks and various forms of utilities all crisscross over the same plot of land, compliance with the provisions of laws on the ground is difficult.

An overwhelming proportion (93%) of the survey respondents supported the development of a new legislation integrating 3D property rights aspects. Prior to this,

the present cadastral mapping is moving towards a system whereby property can be manipulated, processed, and managed in a three-dimensional. The mapping system that is being contemplated in Malaysia provides vital information, including location and ownership for properties. Whereas the current cadastre information serves present needs, there will be a time when the information can no longer cater to more advanced and complex situations that result from rapid urbanisation and land scarcity. What will inevitably be required, therefore, is a more advanced system that incorporates suitable legislative and technical solutions in parallel with the implementation of 3D property rights.

Interestingly, the majority of the respondents, (65%) thought that new 3D properties should be registered as leasehold rather than freehold properties. It was thought that such leases should run at least 60 or 99 years, according to 69% and 21% of the respondents respectively, to maintain the worth of the assets and for them to be easily transferable. Ten percent of the respondents opined that the lease should be 21 years only. This shorter period is used in complicated urban multi-level mixed developments, or in the allocation of property rights concerning underground facilities in large urban areas (Mytروفanova, 2002).

6.3.4 Institutional

There are two principal systems in the Malaysian cadastre system, namely the Cadastral Database Management System (CDMS) operated by the Department of Survey and Mapping Malaysia (DSMM), and the Computerised Land Registration System (CLRS) that is under the purview of the State Land and Mines Office (PTG) and the District Land Office (PTD). Both systems deal with properties located below, on and above the ground surface. The CDMS database stores information about land attributes, spatial objects and other things while the CLRS database stores information on land ownerships, land tenures and so on.

In Malaysia, the cadastre system that has served the country for more than a century may not be able to continue doing so due to the lack of an advanced level of legal and technical framework. Only 45% of the respondents expressed satisfaction with the current legal institutions in enforcing the land law. Another 13% indicated that they were dissatisfied. It would appear, therefore, that legal instruments needed to be further improved to enforce land law satisfactorily. This is because land use is becoming so intensive, and different types of properties are now located in a complex three-dimensional configuration, especially in the city centre (Ahmad Nasruddin and Abdul Rahman, 2006).

In response to the question whether Malaysia had a statutory system of land registration, which recorded land rights, including ownership in three-dimensional separately, 61% of the respondents in the survey answered in the affirmative, whereas 27% of the respondents disagreed. Almost 78% of the respondents agreed that the main obstacle in adopting 3D cadastre was the slowness of the legal and organisational systems to change and adapt. The laws to which 3D cadastre is subjected include 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).

Traditionally, the Malaysian cadastre system consists of different structures. The jurisdiction for land registration is under the administration of the State government while cadastral survey and mapping are under the federal government and managed by different government authorities. There is a general sentiment that there should be one authority conferred with the power to grant and authenticate land titles. There has been concern that the security of tenures could otherwise be jeopardised. Accordingly, 77% of respondents of a survey thought it would be easier to register properties in 3D with a single authority although 23% respondents thought it would not be more difficult to register with multiple authorities.

From the survey carried out in the present study, almost two-thirds of the respondents in the survey felt that one specific government authority should be legally entrusted to maintain the 3D land register. Feedback from the Department of Survey and Mapping Malaysia (DSMM) and licensed land surveyors showed that

more than two-thirds of the total respondents agreed that DSMM should be responsible for maintaining the survey and mapping of registered 3D properties. Nevertheless, these two systems work separately in each organisation and have different legal aspects, which are still handled in the traditional method.

The Department of Survey and Mapping Malaysia has developed the Electronic Strata Module, this module consists of Strata Lodgement Module, Electronic Strata Survey Module and Strata Verification Module. The results of the survey carried out in the present study on Electronic Strata Module showed that more than half (62.2%) of the respondents thought that surveying and mapping methods should be understood by surveyors and land administrators while slightly more the one-third (37.8%) respondents either disagreed or were unsure. This system has been developed to ensure high integrity of the data and ready in GIS application. Various checks are in place to assist users when making decision on the validity of data before posting it to the database.

6.3.5 Cadastral Survey and Mapping

The questionnaire survey showed 51% of land administrators and 62% of land surveyors in Malaysia had knowledge of the current cadastre system, surveying and mapping methods. According to the procedure in Malaysia, a cadastral map, or better known as the Certified Plan would be produced for the plot(s) of land after the final survey of an individual parcel of land or several related pieces of land. A Certified Plan is prepared following the format determined by the Department of Survey and Mapping Malaysia. It shows the lot boundary in various scales with a given plan number as well as information pertaining to the lot location, number, area, bearing and distance.

Immediately after approval of the Certified Plan, the Document of Title, such as Registry Title and Land Office Title, would be prepared, approved and issued to

the owner. The Registry Title refers to the title evidenced by a grant or State lease or by any Document of Title registered in a registry under the provisions of any previous land law. On the other hand, the Land Office Title is a title evidenced by a *Mukim* grant or *Mukim* lease, or by any Document of Title registered in a registry under the provisions of any previous land law. At present, most certified plans and Documents of Title only represent the rights of the ground surface level by descriptions of surface boundaries and the rights above and below the surface level.

Averages, about 58% of survey respondents were of the opinion that all perimeter boundaries of the 3D property were identifiable, although another 29% thought otherwise. Many respondents felt that other relevant information on 3D properties and their regulation should be systematically collated. Unlike the situation where the limits of the properties are only surveyed and indicated on plans, 3D geographical visualization methods could be employed to record many identifiable features such as land use, facade, front, back, and side elevations, services, utilities, lamppost, traffic lights, even the roof, and a whole multitude of other features could be shown. The captured features and data would vary according to need.

6.4 Summary

Validation support from licensed land surveyors and other professionals involved in the relevant field had been carried out (see Appendix C2). This was to validate proposals of amendments and recommendations for changes in interpretations and sections in 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). The validation also involved proposals of amendments and recommendations for changes in the format of the Certified Plan and Document of Title for 3D property objects to facilitate a modern Malaysian cadastre and land administration system. However, only about 10% of the valid respondents contributed to the validation. There are limitations to get validation

from all valid respondents due to several factors, such as the availability and time constrain.

The increasing number of land management professionals and licensed land surveyors is indicative of booming high-density developments in urban areas in Malaysia. In big cities, there is growing interest and demand in using the space above and below the ground surface for real estate constructions. However, there is a distinct feeling among Malaysian cadastre professionals that the legal changes in the land registries in Malaysia have not kept pace with the changing trends in urban development, and there are still difficulties in registering the ownership of properties that are created on, above or below the ground surface. Therefore, there is consensus among the survey respondents regarding the need to register stratified property and to clarify the legal status of such properties in Malaysia, so that they can be managed and administered within the framework of the law.

In brief, a new cadastre system should reflect the existing real world objects according to the three-dimensional appearance and with its own legal rights. Consequently, 3D cadastre linked to comprehensive legal, organisational and technical specifications will go a long way towards solving the problems arising from the nature to the three-dimensional urban development in Malaysia.