

OVERVIEW OF THE 3D PROPERTY DEVELOPMENT

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ABSTRACT

The aim of this paper is to give an overview of the 3D property development by looking into the field of property, 3D property and its rights as well as the categorisation of 3D property issues relating to rights. Since individualisation of property started originally with a subdivision of land using on surface boundaries in the cadastral system, therefore, it is good to investigate how do other countries deal with three-dimensional situations, concerning on legal, technical and organisational aspects before ending with the summary.

Keywords: *land administration, 3D property rights, legislation, cadastre, cadastral survey*

1. Property

It is duly emphasised that this is not an easy task in finding a clear and unambiguous definition of real property or property. To avoid confusion and misunderstanding, it is necessary to make the definition as precise as possible. Before discuss on what 3D property is, it is important to generally know what real property or property is about. It is difficult to determine what is really real property or property (Mattsson, 2003a) because it is not a homogenous and standardised term, and different authors present different definitions (Paasch, 2004). The 'real' in real property is usually associated with something solid, fixed and permanent, which the term 'real property', is often use to denote a house or a building, but in a legal sense it is physical object attached to land (Paulsson, 2007). These physical features together with its institutional rights are often referred to as real property or real estate (Larsson, 1997).

Property, however, that is with a few exceptions, the law only recognises property delineated on the ground by what are termed x and y coordinates. In reality, properties have a three-dimensional extent. Theoretically, they can be likened to cones down to the centre of the earth and projecting into outer space, but in practice, it is more asserted to say that they comprise of what can be asserted. The essential point, however, there is no defined limit in terms of depth or height, and accordingly that no one else can assert ownership within the theoretical cone (Mattsson, 2003a).

According to Khublall (1991), property can be classified into movable, that is pure personality, and immovable, that is realty and chattels real. Various estates and interests can be created out of the same parcel of land and these can be owned by different peoples either concurrently or in succession. He then describes:

“Real property is that class of property, which in medieval times in England would be returned to the dispossessed landowner by means of a real action brought in the common law court”.

(Khublall, 1991: 6)

Dale and McLaughlin (1999) also describes land as real or immovable property that include all things attached to it, such as building, mineral and the air above. Some countries made distinct between land as a natural object with soil and a surface, and property as buildings or multi-level buildings (A multi-level building also referred to as 3D property and stratified property in this research) and other fabricated objects attached to the land. However, in the natural context, land will be regarded as including all types of construction and development, while property will normally be used more specifically to relate to the abstract nature of land.

Below are some of the definitions by authors in some literatures. Dale and McLaughlin defined property as:

“Either the buildings associated with land or more specifically the legal rights attached to the land”.

(Dale and McLaughlin, 1999: 164)

Another example, according to Swedish Land and Cadastral Legislation (2007), real property is land and divided into property units. A property unit is delimited either horizontally or both horizontally and vertically. It further illustrates that:

“A property unit includes buildings, utilities, fences and other facilities constructed within the property unit for permanent use, standing trees and other vegetation, natural manure”.

“A property unit also includes a building or their facility constructed outside the property unit; it is intended for permanent use in the exercise of an easement in favour of the property unit and does not belong to the property unit where it is situated. The same applies concerning a utility or other device for which a utility easement has been granted, if in cadastral procedure under the Utility Easement Act (1973:1144) it has been ordained that the right shall pertain to the property unit”.

(Swedish Land and Cadastral Legislation, 2007: 7)

Finally yet importantly, individuals or groups of individuals, legal persons or by the state can hold property. As stated by United Nations Economic Commission for Europe:

“Property may be defined as an object to which legal rights may be attached, especially rights of ownership. The object may be tangible, as in case of physical pieces of land (in which case it is often referred to as real property) or an item such as a personal possession that has been bought in a shop, or intangible as in copyright that may relate to a piece of intellectual property”.

(United Nations Economic Commission for Europe, 2004: 8)

However, these types of definition mentioned above cannot be viewed as a proper definition, since it is used in making a circular definition. The concept of property is so fundamentally involved in our ordinary life and speech that it is difficult to step back and isolate it from evaluation. Properties are possible only within the context of certain prevailing rules and conventions (Snare, 1972).

2. Types of Property

A difference can be made between ownership of real property or immovable property, and ownership of personal property or movable property. Dale and McLaughlin (1999) use the assumption that the law of property distinguishes between real and immovable property as opposed to personal, intellectual or other types of movable property. It is important to separate the concept of property from the physical object. Property is an abstract right in or to things. Legal interests are rights in land associated with fixed objects. Abstract rights deal with the physical nature of land to define what and when to be done with property.

There are four types of property. First, common property is vested in a community and is specified by right of all users of the community to access and not to be excluded from the enjoyment or use of the object owned. Under common property, individuals have rights and obligations in common with all other users.

Often owners will incur additional restrictions and responsibilities for protection of the property owned.

Second, private property is specified where a single party is vested with the right to exclude others from exercising or enjoying the rights attached to the property (Park, 2003). It has full and exclusive control over the use and management of land or resource for an unlimited duration (Dalrymple, 2005). Third, state property is land held by the state and vested in a public agency, which is created to serve the public but with limited access (Chong, 2006). Finally, open access refers to areas of resources that have unrestricted access and use without any rights, restrictions or responsibilities. There are no prescribed purposes to these areas and anyone can appropriate benefits from the resources (Dalrymple, 2005).

3. Property Rights

The 1989 World Development Report on Financial Systems states that:

“The legal recognition of property rights—that is, rights of exclusive use and control over particular resources—gives owner’s incentives to use resources efficiently. Without the right to exclude others from their land, farmers do not have an incentive to plough, sow, weed, and harvest. Without land tenure, they have no incentive to invest in irrigation or other improvements that would repay the investment over time. Efficiency can be further served by making property rights transferable”.

(World Bank, 1989: 86)

In addition, Enemark give an overview of the property rights as:

“In the Western cultures, it would be hard to imagine a society without having property rights as a basic driver for development and economic growth. Property is not only an economic asset. Secure property rights provide a sense of identity and belonging that goes far beyond and underpins the values of democracy and human freedom. Historically, however, land rights evolved to give incentives for maintaining soil fertility, making land-related investments, and managing natural resources sustainably. Therefore, property rights are normally managed well in modern economies. The main rights are ownership and long-term leasehold. These rights are typically managed through the cadastral/land registration systems developed over centuries. Other rights such as easements and mortgage are often included in the registration systems”.

(Enemark, 2009: 4)

Ownership can be described as a bundle of rights that are defined by law (Larsson, 1997). As stated by Paulsson, a bundle of rights means that:

....the attributes for each property unit is a system of rights that can be easily distinguished, but where the different rights are separate and may be transferable independently, being used simultaneously by different. Such rights, for example, are leasehold, rental tenure, road rights or easement”.

(Paulsson, 2007: 26)

As pointed in Dale and McLaughlin (1999), a property system may be formal or informal. In formal property systems, property rights, such as interests are explicitly acknowledged and protected by the law in most developed countries. While, in informal property systems, property rights are recognised by the local, informal community but which are not formally acknowledged by the state, which exist in most developing countries without proper legal system. Therefore, rights may be illegal because the laws are inappropriate. This was further emphasised by Simpson (1976), he believed that, to formalise property rights, it should not change the customary property system. He also mentioned, adjudication recognises existing rights but does not create new ones.

According to Alchian and Demsetz (1973), property rights may exist a particular right of use in a society that did not exist earlier. To this regard, a recent research by Chong (2006) has categorised the property rights into five characteristics, which are objects of property, subjects of property, users of property, enforcement of rights and finally transfer of property. Furthermore, a real property rights is defined by Larsson as:

“Real property rights can be seen not only as a means of securing exclusive control of resources within a given area, but also as a method of protecting resources or investments”.

(Larsson, 1991: 9)

Rights maybe held by individual or groups of individuals (*Federation Internationale de Geometres*, 1995). It was also emphasised by Stevenson as:

“Property rights are specifically relationship between persons regarding use of a things....Various rights, duties, liberties, powers, immunities and liabilities combine to define a person’s property rights (ownership rights) in a thing and how another person is morally or legally require to act”.

(Stevenson, 1991: 50)

Furthermore, Snare (1972) stated that property rights in some sense exclusive. However, there are many exclusive rights, which cannot be transferred and thus would not be called property rights. As we can see that, property rights in many countries are not only limited in vertical direction. They can extend from the centre of the earth into the sky although they are restricted by mineral and flying rights (Stoter, 2002).

To sum up, property rights is well managed by the modern economy. They supported the theoretical and administrative aspects through legal theory, economic theory and sophisticated registration systems (Bennett, 2006). A good land administration system, cadastral system and registration system are required in order to provide an effective property rights infrastructure.

4. 3D Property

When discussing what 3D property rights are, it is necessary to define firstly what 3D property is. As mentioned by Paulsson in her doctorate thesis about 3D property rights:

“It is not always easy to understand what is really meant by 3D property, as the concept has no simple meaning. There is no clear and unambiguous definition of this concept, especially since its forms vary in different countries and respective legislation, each having its own definition”.

(Paulsson, 2007: 25)

It is worth to mention that issues of three-dimensional determination of property rights are becoming more and more important. In general, 3D property means multiple use of land parcel when there is a need to use space under or above the land. It is mostly related to urban areas with intensive use of land in big cities or metropolitan areas. In these areas, there is a growing interest in using above and under the land space for different kinds of activities.

It is important to mention that the concept of 3D property depends mainly on the legal system. Each legal system has its own instruments for multiple use of 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 literatures use both 3D property and 3D cadastre to describe this phenomenon. 3D cadastre (Stoter, 2004) seems to be more widely used internationally and devoted to 3D property aspects. However, 3D cadastre emphasis is often placed on technical issues, while 3D property is more connected with legal issues (Reshetyuk, 2004). In order to describe this research legally, it is better to use the term 3D property rather than 3D cadastre here. It happens to be hard to find a suitable common definition for 3D property as well as 3D property rights. Below are some different definitions and descriptions of 3D property that can be found in the literature.

As stated by Mattsson:

“A property then is a proprietary two-dimensionally defined right in land, the definition of which is determinate in the third dimension of depth/height. This 2D definition of property is, if anything, a historical accident. But land, buildings and structures cannot be rationally managed in a modern society, and especially not in urban areas, without methods for creating three-dimensionally (3D) delimited rights (also delimited in terms of height and depth, i.e. with x, y and z coordinates)”.

(Mattsson, 2003b: 2)

One definition presented by Dutch researchers is that a 3D property unit is a bounded amount of space to which a person is entitled by means of real rights. With this definition, a traditional parcel would also be a 3D property unit, without the particular issues connected with the third dimension. In areas with high population densities, 3D property situations with high property values are common (Van Oosterom, Ploeger and Stoter, 2005). This type of 3D property situation is where property units are located on top of each other or engaged to one another, which is considered as a stratified property. A stratified property is where several users are suing an amount of space limited in three dimensions and positioned on top of each other within one surface or crossing parcel boundaries, and where real rights are established to entitle persons to the separate volumes (Stoter *et al.*, 2004).

3D properties are not something new but they are like other conventional properties. They can be transferred, mortgaged, expropriated, inherited and can be created by cadastral procedures as a subdivision, partition and amalgamation. In my opinion, 3D properties are an extension of the concept of conventional properties, which possess all of the features pertaining to conventional properties, and can be integrated in the same legal framework as conventional properties. However, 3D properties have more advanced features where they are volumes, parts of spaces, while conventional properties are areas and parts of the earth's surface. 3D properties can occupy different parts of space. They can be subdivided into strata that create separate parcels above or under the original surface parcels.

Mattsson (2003b) has also made a general statement on 3D property where 3D property is in principle the same as a conventional property from a legal point of view. The difference is that they are differently delimited and that 3D properties can be abolished more easily if they are not appropriate to their purpose. For instance, if a railway tunnel is constructed below a private property, some form of right must be created to the use of the space. Another example, like a balcony projecting over a street, may also need to be specially dealt with in the confines of law. The establishment of 3D properties should take place only when it is considered more purposeful for the future and when economic benefits of such establishment outweigh its costs.

In the new Swedish legislation about 3D properties, for example, such 3D property is defined as a property unit that as a whole is delimited both horizontally and vertically (Swedish Land and Cadastral Legislation, 2007). However, this definition is suitable for the Swedish type of 3D property, but is too narrow for an internationally valid definition. What includes in the definition are more on the purpose and use of the 3D property, rather than what the physical object really is. Although Mytrofanova (2002) describes 3D property as the multiple use of a land parcel where this is a need to use space under or above the land, but this is not suitable as a definition as a whole for the actual 3D property unit itself, and does not really define what a 3D property is. It only defines for what it is used.

In the most general sense, a 3D property can be defined as a property delimited both horizontally and vertically in length, width, height and depth, and sometimes can be defined as three-dimensionally determined property. Another definition that is more or less neutral and can be used in most countries is that, a 3D property is a volume that is delimited in length, width, height and depth. The latter definition is even more suitable as it reflects the physical nature of 3D property. Introduction of the concept of 3D property establishes a strong link between the real world and legal cadastral entities. They have been considered three-dimensional long ago. With 3D property, which differs from on surface properties where there must be no gaps or overlaps in their boundaries, 3D property can be located above or below one another.

5. 3D Property Rights

The concept, definition and term of 3D property rights vary in different countries and legislation, each with their own definition. The concept of 3D property rights depends on the national legal system (Stoter, 2002). According to Paulsson (2007), in order to give a more exact definition of a 3D property rights, it is therefore necessary to look at the legislations of different countries that have the possibility of 3D property rights formation. A conclusion from the first International Workshop on 3D cadastres in Delft was that the concept of property mainly depends on the national legal system, where each such system has its own instruments for multiple use of land (Registration of Properties in Strata, 2002). A common definition thus does not seem to exist. Each researchers dealing with this term choose their own stipulated definition or description.

As Paulsson said, two main types of 3D property rights can be identified when studying this concept. She noted that:

“The independent 3D property type is the “pure” type of three-dimensional delimitation of space, and the condominium type is apartment, ownership, usually connected to a building, with an owners’ association managing the common areas. In the countries and states around the world having different 3D property rights systems, there are often specific terms for forms that exist within the legislation, such as “stratum” for the independent 3D

property type and “strata title” for the condominium type in New South Wales in Australia, but no general term seems to exist, including these and other forms, that can be counted as 3D property”.

(Paulsson, 2007: 28)

Independent 3D property type, also known as public 3D property type is a model of a sharing nature, intervening in the parties' ability to share their property units as they wish, and imposing a certain framework on them, having an inevitable measure of co-ownership. However, this type of rights is practically not recognised in judicial systems in most of the countries where title registration exists because there is no three-dimensional cadastral survey being carried out and the rules for three-dimensional survey and mapping for registration purposes have not yet been established (Sandberg, 2001). Therefore, it is a vital need for the creation of both a doctrinal and practical professional rules for three-dimensional survey and mapping activities for title registration purposes.

A condominium type, also known as common type, which is a form of 3D property rights, is defined by the United Nations Economic Commission for Europe (2002) as a part of common law jurisdictions that constitutes a special form of ownership giving the proprietor an absolute title to the property. This type of ownership is just one common way for people to own properties containing a number of flats or unit.

5.1 Classification of 3D Property Rights

There are different classifications on owning a building or a piece of land in three-dimensional delimited. Three-dimensional delimited properties can be classified into four types. They are public rights, common rights, management rights and private rights.

There are three types of 3D property under public rights, namely air space 3D property, 3D property on the ground surface and subsurface 3D property. The splitting of land into independent public rights is used in some deed recordation system prevails countries to divide ownership three-dimensionally (Sandberg, 2001). Sometimes, it is called air rights or air space rights. This is to make a distinction between the three-dimensional delineation of the unit and its physical content (Sandberg, 2003). As described by Paulsson:

“This model can be seen as an independent form of ownership, since it provides for the registration of separate three-dimensional property units independent from the underlying parcel. There is no need for a connection with the ground parcel. It enables ownership of air rights to be subdivided. It is also possible to subdivide air space or areas under ground into properties. Units thus can be created in subsurface space in the same manner as tracts of air. In some legislation, a 3D property does not have to

be a closed volume, but may extend from a specified level and as far into the ground or air as private ownership extends, for instance as with the stratum in New South Wales, Australia.... This type of property can either be independent from the boundaries of the surface parcel and extending across several ground parcels, as the volumetric parcel in Queensland, Australia, the stratum in New South Wales, Australia, or the 3D property in Sweden, or the air space is limited to be located within the boundaries of the existing traditional 2D parcels, as the air-space parcel in British Columbia, Canada. The model is quite flexible and may be used for complicated infrastructure developments in a modern urban environment. There is no requirement of any common parts for this kind of 3D ownership”.

(Paulsson, 2007: 33)

In brief, the air space 3D property is not bound to a specific building or construction. In some legislation, it may contain only a space volume (Paulsson, 2007). On the other hand, the 3D property on the ground surface may only be created within a building or construction, the property will cease if the property is damaged. Such types can be found in the newly introduced 3D property legislation in Sweden. For the above-mentioned types of 3D property, it is frequent to establish an agreement, containing the rights and duties of the respective proprietor as well as the resolution of disputes between the owners.

The other type that is broadly used for 3D property is the use of common rights. Common terms for this type of 3D property rights for condominium ownership is strata title, this type of ownership comprising individual ownership of dwellings in one building. It is derived from the common law (Reshetyuk, 2004) but is used in both civil law and common law countries, and is called strata title in countries with title registration systems, which are mostly common law countries (Mytrofanova, 2002).

The strata title here refers more to the document of title than ownership of the property itself and can be seen more as a sharing model than an individual one:

“Co-ownership is a necessary part of this model, as well as a certain framework for the relations. The condominium is owned, and connected to it is a share in the common property. The condominiums are regarded ownership-wise as owning land. They are registered as independent units and can be owner-registered and mortgaged. The condominium right must relate to a surface parcel on which the building containing these rights is erected. The model is mostly used for multi-story buildings, but also for underground or linearly built structures, natural physical formations, or for bare parcels without any construction at all. While some researchers consider the condominium to be a

particular form of 3D property, there are others that do not share this opinion. It can also be considered as some kind of quasi-3D property”.

(Paulsson, 2007: 34-35)

Further, strata titles in most countries are used for residential purposes, but in some countries, such as Malaysia, they can also be used for commercial and industrial purposes. Paulsson also says:

“A difference from the independent 3D property type, which legally is completely separated from the land parcel, is that the condominium ownership always includes a share in the related land parcel. Another distinction that can be made in some legislation is that separate buildings can be established as 3D property, and parts of one common building are arranged as condominiums. This cooperative model interferes with the ability of the parties to design their property units as they wish, unlike the independent model, and it enforces a particular framework with an unavoidable measure of cooperation. At the same time as the condominium contains a certain limitation of private property rights, there are advantages of having clear and reasonable rules for managing the common elements for the benefit of all owners....The flexibility in the common law models allows implementing both the air space rights model and the condominium model within the legislation of one country....”

(Paulsson, 2007: 35)

Another way to gain private ownership of an apartment without owning it as property is through management rights. The characteristic of this management rights is that the formal owner holds the private rights of occupancy to condominium and stands between the resident and the property by proprietary leases, gives the rights to use it with shared expenses (Lilleholt *et al.*, 2002 and Merwe, 1994). This type of user right is tenant ownership system, which exists in Sweden. Besides, also a limited company system exists in Finland (Viitanen, 2001) where the building is owned by housing stock company while each tenant is granted private rights by owning stocks in the company based on lease. In addition, a housing cooperative system that exists in Denmark and Canada, where the owners of the building allowed other person occupying the apartment unit by pay a refundable deposit (Merwe, 1994).

Finally, three-dimensional use of land is also probable through private rights, such as freehold, leasehold and easement. It is often used for underground transportation or piping purposes. As Paulsson expresses it:

“The use of a lease or easement makes it necessary to subject the boundaries of vertical 3D units to the original borders of the 2D parcel above ground. It also limits the possibility of sub-splitting the 3D unit further, and the freedom of freely designating the reciprocal relationship between the owners”.

(Paulsson, 2007: 42)

5.2 Natural of 3D Property Rights

This section will cover major theories about 3D property rights with highlights on condominium system, condominium ownership, legal framework, subdivision, boundary, easement, common property, by-laws, management of strata scheme, owners' association, settlement of disputes and insurance in Western European countries. As Paulsson points out that:

“Management is a fundamental aspect for 3D property relating to the independence between such units. In all communal ownership, such as the condominium, it is necessary to deal with externality problems that are common to all forms of co-ownership”.

(Paulsson, 2007: 51)

In addition, Elinor Ostrom has presented a model for controlling common-pool resources with a set of design principles, such as clearly defined boundaries, collective choice arrangement, monitoring and so on (Ostrom, 1990). Therefore, Paulsson study of 3D property rights (Paulsson, 2007) emphasised that these design principles are a helpful tool for evaluating the management questions and the important features in this field.

5.2.1 Condominium System

Most of the multi-storey housing in one country is located in the cities and towns. It is the form of the transfer of ownership of an individual plot of land to multiple ownership together with shared rights and obligations for the common properties ownership, it is generally known by the term 'condominium' in European countries or better known as 'strata title' in Malaysia and Australia. In addition, it may be regarded as one of the most important and fastest growing areas of co-ownership where two or more entities are entitled to use and enjoy property with equal rights (Tracht, 2000). Laws on how condominiums should be established regulated and function that regulate condominium ownership of housing are now in force in many countries.

According to United Nations Economic Commission for Europe, some of the condominium laws are very comprehensive while others are vice versa:

“In Western Europe, the detailed structure of laws on condominiums varies widely between countries. Whilst some laws are very detailed and regulate in detail the inner workings of the condominium, others are more general and cover in detail only issues of public sector importance. These more general laws are normally accompanied by special guidelines covering the different aspects of establishing and operating condominiums. The choice between these two different approaches to the legal framework must be made in each separate case. It is however important that the law on condominium ownership together with guidelines, training and educational manuals for members of condominiums, administrators etc., should together cover all the major elements needed to make condominium ownership a success”.

(United Nations Economic Commission for Europe, 2002: 6)

As Paulsson states:

“While as for co-ownership, it is the right itself that is being shared, apartment ownership is characterised by a division of the real property, but not a complete division, since only the apartments are individually owned, while the rest of the building, land, etc, is owned in common. The combination of this individual ownership and common ownership is what characterises the condominium system. Included in the ownership interests of an apartment building are usually both the individual ownership of the apartment and a share as tenant-in-common of the common property and the jointly owned land, which are indivisible and registered as one real property unit. The ownership of the apartment must be legally inseparable from ownership of the share of common property belonging to it according to the international standards of condominium law”.

(Paulsson, 2007: 55)

She went on to note that:

“To include these two aspects that characterise the condominium-the independent and cooperative-it is necessary to create laws with the purpose at the same time of creating vertically layered independent property units and establishing a detailed regime of cooperation. Since the units are part of a larger complex, there is a need for cooperation in management, which also makes the sociological aspect important”.

(Paulsson, 2007: 55)

Again, she explains that:

“Since the condominium form is based on a combination of individual and common ownership, an important question is where to draw the line between these two types of ownership. Reasons to choose common ownership of certain shared goods can be economies of scale for such property with respect to recreational facilities, and non-excludability for objects such as roofs and supporting structures. This can also be explained on the basis that if a property benefits just one owner, it should also belong to that owner alone so that this party bears the costs for maintenance and the loss from any destruction, while property with benefits for all owners should belong to and be paid by all, so that they as a group bear the loss from failure or destruction and by that minimize insurance costs. Belonging to the public goods provided is not only the physical property, but also the rules governing the community. The aim for condominium developers should therefore be to create such rules and structures to maximize the satisfaction of the purchasers by encouraging efficient decision-making and reducing conflicts”.

(Paulsson, 2007: 56)

Furthermore, she notes that:

“The condominium can also be regarded as consisting of three components, the individual ownership of apartment and common ownership of the land and common parts of the building as well as membership of the owners’ association. These elements together are called a threefold unity, a trinity, and are inseparably linked to each other. They can only be dealt with and transferred together as a unit and thus may not be disposed of separately. The third element has been debated as to whether it really is a separate part of the condominium concept and not just a consequence of the co-ownership right to the common parts”.

(Paulsson, 2007: 56-57)

5.2.2 Condominium Ownership

The institute of condominium ownership has many advantages for the owner of the rights. One example is the better use of property and security of tenure. It is also possible for the purchasers to get lower costs for owning their own home since housing rights are valuable investment. When comparing owning with renting, owners of condominium units do not pay rent, they invest in their own property.

Some benefits are the possibility of selling for the market value, individual mortgages, profit from one's own improvements of the parcel, complete protection from eviction, as well as a greater influence on the management of common property. Compared with single-family houses, the ownership of strata title has the advantage of the maintenance provided, guarding, comfort and security of the property (Paulsson, 2007).

Condominium ownership can be applied to different forms of property, such as multi-storey buildings for residential purposes, buildings containing both dwellings and units for other functions. For instance, commercial purposes, and other building types such as town houses, terraced housing or other joined or connected buildings used for residential, mixed or non-residential purposes (United Nations Economic Commission for Europe, 2002).

A strata title unit is to be understood as part of property that forms a clearly demarcated part of a building or a plot of land as described in such document of strata title. An individual, a group of peoples, a company or a municipality can own these parts of a building containing parcels while the rest of the building is called common property. These common properties as described by United Nations Economic Commission for Europe as:

“The “jointly owned parts” of a condominium are all those parts of the property, including the land plot, which cannot be clearly defined as “privately owned units”. Such jointly owned parts include all engineering systems, equipment, circuits and devices, which serve the entire property, or parts of it, covering more than one “privately owned unit”. “Jointly owned parts” are generally defined as the joint property of all owners of the condominium”.

(United Nations Economic Commission for Europe, 2002: 8)

To conclude, even though the strata title form was initially proposed for residential purpose, it has many other purposes, such as shopping centres, office buildings, car parks, hotels and resort condominiums. It is also probable to have mixed developments, where different purposes are located within the same development scheme with mixed use, such as residential, commercial and industrial purposes. For instance of this is a building with basement car parks, retail outlets on the ground floor, offices on the floors above and residential apartments above offices which better known as service apartment in Malaysia.

5.2.3 Legal Framework

Shared ownership of properties under condominium system needs rules to regulate common matters. Therefore, it is important to create legal mechanisms to manage the legal problems concerning the coordination of conflicting preferences and actions of co-owners in any case of co-ownership. As Paulsson notes:

“The lack of such mechanisms may lead to cases where the owners impose excessive costs on their co-owners by certain activities, or invest too little in activities where the co-owners gain from the benefits. ...Outside the legal mechanisms, social sanctions and norms are important factors in the coordination. Successful legal mechanisms for regulating co-ownership lead to reductions in the transaction costs that come from negotiating, establishing and enforcing the shared ownership arrangements”.

(Paulsson, 2007: 59-60)

There are certain preconditions that are essential in order to guarantee and secure ownership for condominiums. According to United Nations Economic Commission for Europe, these include:

- “(a) Clear, legal definitions of the rights and obligations of ownership (law on condominium ownership of housing);*
- (b) A legal definition of property rights (law on land registration);*
- (c) Sound administrative structures and procedures for the transfer of property rights;*
- (d) Effective and transparent legal procedures to handle property disputes;*
- (e) A clear distribution of rights and obligations between the borrower and the lender in the housing sector”.*

(United Nations Economic Commission for Europe, 2002: 12)

In addition, a general legal framework, such as a condominium agreement, a declaration of division of ownership, a management contract and by-laws or house rules is needed in owners' association or Management Corporation for strata title scheme in order for it to function effectively. Paulsson states that:

“The condominium agreement is the central document and contains a more precise rules and regulations for the owners' association than normally included in national condominium laws, for example rules for voting rights of owners. A declaration of division of ownership is not normally necessary in countries where there are already satisfactory, clear and registered agreements on property division. ...A management contract is needed when there is a professional manager taking care of the day-to-day running of the association. The rights and obligations of both parties are stated in such a contract. House rules are used to govern the day-to-day relationship between the owners”.

(Paulsson, 2007: 60)

This mean, without this legal framework, the management of the common property of condominiums, such as roofs, staircases, external walls, pipes, wiring and other shared things is not possible. For this, United Nations Economic Commission for Europe (2002) describes that the absence of legal framework would have dramatic consequences for the housing stock, and for the value of the privately owned units.

5.2.4 Subdivision

Individual condominium ownership is created when a building is divided by law into parcels and common properties. It is then possible for individuals to acquire ownership to the strata parcel. The strata title owners usually have the right to dispose of their property, although some statutory provisions or guidelines may limit this right. To grant a strata title ownership, the registration is made of a document showing how the property is divided into parcels and common properties. There are usually certain requirements for the buildings and land parcels within the strata title scheme by law and by local authorities. Most statutes allow strata titles to be established before the buildings are constructed, such as the provisional block provision in Strata Titles Act 1985 (Act 318) for Malaysia. There are also provisions regarding whether the building has to be constructed on one single plot of land, such as in Malaysia or whether it is possible to let a strata scheme be developed on several plots (Merwe, 1994).

Finally, there is also a need for termination of a strata title scheme in particular circumstances. When the buildings are destroyed, damaged or deteriorating in any way, the strata titles cannot continue to exist. Because of this, laws can provide for termination of the strata title scheme, reconstruction of the buildings or partial termination or reconstruction with reallocation of the remaining buildings (Merwe, 1994).

5.2.5 Boundary

There is generally no description of parcel boundaries in most countries statutes, although it is implied that they must be isolated by walls, floors and ceilings. Some countries require that, the parcels cannot be consisted of parts of land or cubic airspace, parts of the surrounding masonry must be included in the parcel. Conversely, it is usually possible to choose whether to locate the boundaries on the inside surfaces, outside surfaces or to the centre lines of walls, floors or ceilings of the parcel. This is usually determined by the developer. As Paulsson expresses:

“An apartment unit ... is usually regarded as an area or space that is enclosed by its boundaries together with all material parts included in that space. If balconies, etc. are included in the apartment, the inner surface of these walls, floors and ceilings form the boundaries, as well as the imaginary line stretching from where these walls end. When there are bare land condominium

schemes, the boundaries of the units are defined by reference to survey markers”.

(Paulsson, 2007: 63)

5.2.6 Easement

The creating of easement is to facilitate the strata titles scheme. As Paulsson expresses:

“Statutes may impose several reciprocal easements on condominium owners. Typical easements are for subjacent and lateral support, shelter, passage for water, drainage and other services, but can also be created for such things as light, overhanging eaves and other projections”.

(Paulsson, 2007: 64)

5.2.7 Common Property

According to United Nations Economic Commission for Europe (2002), each unit owner owns a share of the common property. This ownership fraction is specific for each unit and is calculated as the gross area of a unit in relation to the sum of gross area of all units, and is normally expressed as a percentage. However, the area of the common property is not included in the sum of the gross area of all the units, and is only applies to the common property of the condominium. As the following quote from United Nations Economic Commission for Europe confirms, ownership share is important in condominium system:

“Each owner has full and unlimited ownership rights to his unit, unless limited by special laws or regulations. Examples where other laws can limit the owner’s exclusive rights could be: (a) changes in the use of the unit, e.g. from residential to commercial, or (b) subdivision of the unit. The ownership fraction is very important for the owners and for the owners’ association. It determines each owner’s responsibility for the costs of maintaining and repairing the common parts of the property, as well as for the operating costs of the owners’ association”.

(United Nations Economic Commission for Europe, 2002: 9)

The willingness of owners to accept the need to pay higher costs for their parcel is a critical element in securing and strengthening the advantages of condominium ownership. Each owner of a unit in a condominium has very clear obligations and responsibility to cover related costs related to maintenance, repairs and improvements to his unit, and responsible for a certain share of all expenses

connected to the common property of the condominium. It is important that these obligations and responsibility should be clearly understood.

Some statutes distinguish between general common property and limited common property:

“Limited common property is the parts of a condominium building that are reserved for the use of just one or some of the owners, but not for all of them. Usually the agreement of all owners is needed to create such property. The purpose of this can be obtained through a more fair division of costs for the maintenance of that area. Examples of such property are special stairs and elevators, private entrances and bathrooms shared by the apartments on just one floor”.

(Paulsson, 2007: 66)

In summary, the shared rights within a strata title scheme and the collective decision-making and voting require some form of allocation based on a participation quota, fraction of undivided interest or proportion of the common interest and these rights are determined by laws.

5.2.8 By-laws

According to Paulsson (2007), by-laws are optional in Western Europe countries while are obligatory in the Anglo-American countries. Further:

“The provisions given by statutes in most countries are often not considered sufficient when it comes to the more detailed management of a condominium scheme. Therefore, special rules adapted to the particularities of each scheme are developed in by-laws, which are binding on owners as well as other occupants within the scheme. The main purpose of by-laws is to regulate management and administration of the condominium scheme, along with the rights of use for the owners, as well as protecting the interests of the developer and credit institutions”.

(Paulsson, 2007: 67)

and

“The by-laws contain rules regarding the use and enjoyment of the apartment and of the common property. Since the developer or the owners often decide these rules, some statutes state that they have to be reasonable and not arbitrary. Examples of such rules are restrictions on renting the apartment to third parties, limiting

the number of occupants, prohibiting conduct that may cause nuisance and regulating pets”.

(Paulsson, 2007: 68)

Besides, a study by Merwe (1994) states those by-laws are possible to be supplement by house rules, where these house rules usually deal with daily use of the common property issues in strata title scheme, which are less importance and lower standard.

5.2.9 Management of Strata Scheme

According to United Nations Economic Commission for Europe (2002), most condominiums in Western Europe and the United States of America are created before construction is complete and thus before or at the moment of the sale of units to the owners. Majority of condominiums are created in existing buildings where sitting tenants have become owners. Such condominiums need special advice and assistance in managing, forming and registering the condominium. Municipalities should have a role in providing this advice and assistance. In countries where the association is a legal entity, registration of the owners' association should be compulsory. Where such associations are not legal entities, registration would be voluntary.

Management of strata includes several essential tasks. Administrative work is to perform all necessary duties to ensure the strata scheme in a good condition. Different models can be used for the management of the strata scheme. Either the owners can take care of the management, or a professional person or company is contracted to carry out these tasks (Paulsson, 2007). Furthermore, for the strata scheme to function properly, it is important to have a structured and efficient organisation for management. The lack of organisation for management may cause many disputes among the owners and to the financial institutions, which have an interest in the strata title scheme.

On the other hand, condominiums with owners' associations that operates professionally and effectively will incur costs since:

- “(a) Sensible investment in repair and maintenance on a regular basis is necessary to keep the property in good conditions and to maintain its market value. Planning and implementation of such investment is dependent on the effective, professional administration of the owners' association;*
- (b) It is expected that rent levels will increase sharply in future years. A possible reduction in direct and indirect State subsidies, increased costs of utility services and the need for landlords to invest in the repair and maintenance of the housing stock will force rents up.”*

(United Nations Economic Commission for Europe, 2002: 10)

Some statutes are compulsories the owners of the strata scheme to employ a managing agent or administrator to manage the scheme. Usually the rights and duties of the agents are listed, among are to carry out the tasks given by the committee, to maintain the common properties, to collect the maintenance fee from the owners and so on. Legal proceedings may be taken by or against them as the legal representatives of the owners. Hence, it is also possible to make provisions for a special board or council to assist the agents (Paulsson, 2007), such as a Commission of Building and Strata Title Board in Malaysia. To sum up, how the strata scheme will function depends largely on its management. For that reason, it is important to create proper rules for it and to appoint a professional agent to perform this task.

5.2.10 Owners' Association

An owners' association is defined as a legal body established with the legal authority to act on behalf of all the owners and is considered a necessary feature for a strata scheme to protect the welfare of the individual owners, the common ownership, as well as national and municipal interests. The association is considered necessary for the management of the strata scheme (Merwe, 1994). The membership is considered a legally inseparable part of the ownership of the strata unit and it is a private, non-profit organisation (United Nations Economic Commission for Europe, 2002). As Paulsson expresses it:

“The members of the association decide by vote. A board is elected by the members and has the responsibility for the running of the association. There can be an administrator adopted by the board, a legal person who is contractually charged with the day-to-day management of the owners' association, i.e. to take care of the maintenance and operation of the common parts, as well as all matters of common interest. These duties are regulated by provisions in the condominium acts, the regulations of the association, administration contracts, as well as resolutions and decisions of the owners' meetings. Such an administrator can either be an owner of a unit in the strata scheme or an external professional or company”.

(Paulsson, 2007: 69)

5.2.11 Settlement of Disputes

The owners of strata scheme have many crucial obligations. Therefore, it is needed to establish well-organised procedures of rules and obligations, to avoid conflict of the economic stability and community harmony within the scheme. If the rights of the owners within a strata scheme are clearly defined by law, it can reduce

the settlement of disputes among all parties (Tracht, 2000). As was written about most countries experience:

“Most countries use court procedures to settle disputes between condominium owners or between the owners and the manager or the equivalent. Court procedures, however, are not always the most convenient way to settle such disputes, as they can be too cumbersome and expensive. It is common to provide for an easy access to a court procedure, normally in the first instance of the regular court within the district where the ownership scheme is situated. In some countries, disputes may be submitted to arbitration. The problem with arbitration is the excessive costs involved. Another possibility is to settle the dispute in a general meeting. In some systems, a special mechanism or procedure has been introduced to solve such matters. Such special procedures are generally a more inexpensive, quicker and more appropriate way to settle disputes. The procedures are better left to an agency outside the condominium scheme, because if it were up to the executive council or the general meeting, there would be a risk that the harmony within the scheme would be destroyed”.

(Paulsson, 2007: 75)

5.2.12 Insurance

Many legal systems regulating strata schemes clarify which parts of the strata scheme are covered by insurance procured. As describes by United Nations Economic Commission for Europe:

“The association should take out insurance to cover buildings, other common property, equipment and also third-party liability and injury to employees. The extent of the insurance and its cost depend on a number of factors related to the type of building, activities in the building and common areas, building construction, type of equipment and measures taken to protect the property against damage, burglary, etc.

It is advisable to insure against damage to buildings and installations from fire, water, lightning and other natural causes. Building installations and other property should also be insured against damage resulting from the defect of materials and constructions, against rot and fungi, etc. The insurance must also cover third-party liability towards persons and things, caused by falling objects, or resulting from activities in and around the property. Finally, employees should be insured against injury at work”.

5.3 Summary

When talk about 3D property law, the first country that comes to mind is Australia. Australia has had quite a long experience of dealing with 3D property since the Victorian Transfer of Land (Stratum Estate) Act was adopted in 1960. The Australian 3D property system is based on strata and stratum. In this Act, stratum is a layer horizontally subdivided property, both on the ground and in the air, and there is no need for connection with a building. If it contains a building, this building can be subdivided into strata titles. Most recently, there have been changes in the words used for 3D property where strata and stratum have been replaced with the term cubic spaces or volume parcel (Paulsson, 2007).

As has illustrated before, real property is largely thought as pieces of land on the earth surface, which it can be buildings or other permanent structures attached to the surface or extended upwards into the air or downwards into the ground. According to United Nations Economic Commission for Europe (2004), most European countries define this real property as extending from the centre of the earth to the sky, although a number of countries limit private ownership to certain levels of height. Hence, land boundaries are in reality not lines on the ground but it is vertical plane intersecting on the surface of the earth. It is here emphasised that the law of property deals with relations between peoples to things. These meant that lands, construction of works are with intellectual property. The law recognises different types of interest in all things and makes a distinction between the physical object and the abstract rights associated with its use.

It is remarkable that this development has led to a growth of interest in solely three-dimensional delimited properties. Many housing developers, finance providers, owners of utilities infrastructures and so on argue that properties supplemented by flexible three-dimensional rights are not always well designed and therefore, the law should be made to include a solely 3D property formation (Registration of Properties in Strata, 2002).

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