

The Reasonable Land Parcel Identification of Local Government in Thailand

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SUMMARY

Thailand, Sub-district Administrative Organization (SAO) is divided by population number to be the smallest boundaries of local government which have to finance their operation by their own efficiency tax collection. Digital tax map is a tool to property assessment which provided to each SAO without standard guidelines particularly Land Parcel Identification (LPI). The LPI system is advised in two parts as primary key to indicate parcel location and SAO, secondary key to link to databases for interest records. It is recommended that LPI should be compatible to cadastral system which tax map based on. By examination most of digital tax maps produced by usage of orthophotos as a basic map and cadastral map coverage as a data source, LPI should be digital system in 5 parts as province - SAO – UTM coordinate – parcel number – multi owner number. The reason for this suggesting system is similar to the land records under Department of Land's cadastral system due to the unique parcel identification of Thailand's land administration but difference in the format, digital on tax map and letter on cadastral map. It is hopeful implementing the LPI in the future SAO's tax mapping for information technology trend.

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1. INTRODUCTION

Sub-district Administrative Organization is the smallest part of local government in Thailand which have collected property taxes to finance their operation by maintaining an accurate cadastre on tax map which is the most essential of all property assessment tools. A tax map accurately reflects the size, shape, encumbrances and location of each parcel of land in a sub-district. The sub-district's assessor has determined the value basis for the property tax by using cadastral map to locate tax lots and assets. Currently, tax maps are created in digital information that would be tied to a spatial data and to display of non-spatial data.

In this paper, after introducing the nature of property taxation, how to use tax maps as a tool is for local government finances efficiently. The land parcel identification is invented to relate to land record which based on cadastral system in digital tax map for cost effectiveness and functionality.

2. PROPERTY TAXATION CONCEPTS

The local taxes have still dominated by levies on property, primarily reality interests on land. What the ownership pay as property taxes results from applying a tax rate, or combination of rates, to assessed values. Estimating at such values is the composite two elements in the public function known as assessing. Those elements rather crucial preliminary tasks are discovery land value and listing assets of the taxable property. In local government does the job as part of administering a net wealth tax. At any level, assessors are basically appraisers, their assignment being to estimate a value for each taxable property in the jurisdiction concerned as of a specified date, at the actual use of the property. The actual use is generally deems the one most existing on the parcel and thus likely to yield the optimum net return, actual or imputed, to the property owner. Assessing is considered done well if the values resulting from it are uniform, at the level prescribed in governing constitutional provisions and statutes.

2.1 The assessment process

Obviously an assessor is necessarily continuously interested in the parcels of real situated within the jurisdiction—where they are located, how they are used, how much they are worth, and what changes occur in any of such respects. As a natural consequence assessors as a group possess the most complete inventory of land parcel available in sub-district. Taken together, and with allowance for the many variations comprising so varieties, the entities together on tax maps, parcel identification system, and property information records in the work of assessors can be looked upon as sub-district's locally autonomous fiscal cadastre. Tax map, also called “assessment maps” and associated parcel identification system are

fundamental essentials conditioning assessment effectiveness. In many areas they have also become important reference elements in achieved for other governmental function such land use planning, zoning, and the sitting of public facilities. Even property tax is affected, not only because assessors must know its influence, if any, on the taxable component, but also because tax exemption can be investigation, beginning or terminating in response to a change in ownership or use. Theoretically, the contemporary setting of public sensitivity to property taxation, influenced by an impatient technology and by disputes about its burdens and beneficiaries, tax maps are receiving comprehensive attention.

2.2 Tax map characteristic

Tax maps necessarily show boundary lines, dimensions, and a unique identifier for each parcel for their basic purpose is to make possible the discovery, listing and valuation of taxable reality. In its draft, the surveyors suggest that the basic mapping is drawn to scale and delineated for lot lines or property lines, or both, with dimensions or areas, and identifying numbers, letters, or names for all delineated lots or parcel. Generally, the people refer to the basic map as a graphic description or picture of land. It shows the relative size and position of the land with respect to other properties, to roads, highways, and to major topographic features. The maps are actually parts of an identification system, interrelated via parcel identification so that using it can find any given property and trace its history through any succession of changes in ownership and use.

The guidelines to make the map as mentions, modern systems often include basic aerial photography and its associated photo indexes, ground control standards base manuscript maps, the tax map themselves with associated plan and also an index card file or similar component providing cross-referenced ownership and parcel identification numbers.

Possibility. the maps should naturally show location of roads and streets, highways, railroads, power and transmission lines. Also plotted are water and sewer easements, streams, lakes, and even ditches. The government lot numbers are also shown for areas included in the government survey.

2.3 Uses of tax maps

As their nature implies, tax maps constitute the initial resource available to the assessor for accomplishing the discovery function. Using the maps to discover property naturally leads to their use in valuation activity. The assessor's basic estimate of value, for any given property, is always in relation to estimates of value for all others. This is the essence of uniformity, a fundament goal of assessing. Tax maps, together with associated records in the system, provide the means for an overall view of a block or neighborhood , and thus contribute to uniformity among resulting assessed values.

Because values are constantly subject to change, however, in response to in sprite of a change in ownership, or a change in the physical characteristics of the parcel, or a change in external circumstances affecting the parcel, tax maps are also subject to change and must reflect those

which have mapping consequence. The assessor necessarily uses tax maps to keep abreast of change, hence maintaining them is essential to their usefulness.

The major uses mentioned above have given rise to a consensus among assessors to keep tax maps as simple as possible, restricting their data coverage largely to physical aspects cited. Many assessors, for example, omit house numbers, assessed values, and names of owners from tax maps, including such data on associated maps or records in the information system.

The same is true for land use information as local government constitutions. The assessor is always aware of zoned, actual use of parcels, because the assessor necessarily considers such information in existing at value. The linkage between tax maps and land use occurs via parcel identification, and the associated records in the system. Because tax maps are basic and complete, they lend themselves to integration with a comprehensive land data system sensitive to the needs of officials other than the assessors, and to needs of the general public. The land data systems become multi-purpose, therefore, in keeping with optimum use, the need for coordination, at all stages, can be expected to become more important.

3. LAND PARCEL IDENTIFICATION

Land parcel identification emerged in order mainly to spatially represent the activities of owner on their lands, it is scientifically known that cadastre systems are cornerstones of effective land administration and land use management. In the means time, there is no unique solution in identification system for the establishment of their LPI, depending on their current cadastre and administration systems. Mostly, it shall be established on the basis of maps or land registry document or other cartographic references.

Currently, Digital tax map is very important and time consuming process for classify the adjacent land owners. A vast variety of cartography methods for LPI in the main categories considering the main source of reference data is based on cadastral system, the LPI is an inventory similar to the cadastral records, and it is applied to the administration of taxation aid. For the LPI on taxation parcel is a continuous piece of land with any activity corresponded by exacting owner. In additional data as geographic features are based on ortho Imagery or photos to identify instead of large scale topographic map.

Land Parcel Identification on the cadastral system in Thailand under Department of Land regulation is the system of rectangular surveys that land is divided into basically equal sized sheet. In the system are ;

Section I UTM Plat System Dividing,UTM (Universal Traverse Mercator) plat of a zone is divided to rectangular plat system started at the original of each zone to horizontal and vertical direction continuously. A standard plat size is 50 centimeters width and length. Department of Land, the cadastral system based on 1/4000 scale is showed the graphical parcel in meters and boundaries, cornerstones, and land information data. It is generated from 1/50,000 topographic map scale, under Loyal Thai Army Department (LTAD), called L7017 series. A 1/50,000 map is covered 15X15 second (about 27X27 kms) and equal to 169 sheet

on 1/4000 scale. The grid lines are 1,000 meters apart in both rectangular axis and showed UTM coordinate for each grid line in the ten thousandth and a thousandth meter unit (the tenth and a kilometer unit) bold capital number. So a 1/4000 map sheet is equal to a quarter of 1/50,000 map sheet or a rectangular grid in 1/4000 is four rectangular grid in 1/50,000.

Section II UTM sheet name system, it is composed of plat number and sheet number defined by LTAD. The plat numbers are 4 Arabic numbers and a Romans number as the fifth numbers which are the grid lines intersection on the 1/50,000 topographic map called "PLAT". Sheet number is 4 Arabic numbers derived from the lower left coordinate of 1/4000 sheet. The first couple is horizontal ordinate in a unit kilometer and the last couple is vertical ordinate in a unit kilometer.

For 1/4000 sheet name system, under DOL official defined 1/4000 sheet name in UTM coordinate system and referenced to 1/50,000 topographic. The components are 3 parts as;

- The first part is province name of DOL official sheet
- The second part is 1/50000 topographic name on L7017 series which the 1/4000 sheet is on it.
- The third part is two couple number in 4 numbers showed the lower left corner of 1/4000 sheet.

For example; Sheet Name: Nakornrachasrima Province, 1/4000 scale No. 5538IV-4234

The meaning are the 1/4000 sheet on the Nakornrachasrima Province's office and the 1/50000 topographic map numbered 5538 IV on L 7017 series. The lower left corner of the sheet are 42 km horizontal ordinate and 34 km vertical ordinate.

In the design and preparation of a mapping and numbering system for land is base on DOL's cadastral system. On a sheet, there are many parcel numbers which will describe and locate any specific parcel. That is a permanent parcel number started from number 1 to every parcel in order on that sheet till the last one sequentially.

The permanent parcel number is easily adapted to computer technology. Because of its simplicity and utility for data processing programs, it can contribute to the more accurate computation of taxes automatic billing, quicker collection, and swift distribution of tax rates. In addition, immediate retrieval of information through computer terminals is possible by numeric, geographic, or alphabetic filing. These save both time and money for the SAO and the public.

4. TAX MAP IN SUB-DISTRICT ADMINISTRATION

When conventional cadastral systems are examined, it is seen that most SAO have developed their own LPI. Because there are advantage presented by cadastral systems, they are available and familiar to the public and detailed in 1/4000 scale accurately. Moreover, they provide

reference parcels with a unique reference number and readily available cross-checks with ownership information, including geometric accuracy on the national projection system.

As showed most of SAO's tax map are produced by cadastral system which there are very few topographic detail. Ortho Photos are used for overlaying the digital boundary map(Fig 1).



Fig 1. Cadastral map overlayed on ortho photo

For simply information management tool that combines graphical features, parcel polygon, with tabular data, tax assessment records, are need. So graphical feature that is displayed in digital map has a corresponding set of data behind. The LPI is not differentiate whether it is a tax parcel identification number on graphic features or an ownership parcel identification number on tabular data records.

At the present, most of SAO's tax maps are digital which are created by private company outsourcing. The parcel identification is land number on cadastral systems as DOL regulation that is the method of relation land parcel as data or code with any information such as legal description. The parcel numbers are correlated map and individual properly records for uniform parcel identification. It is a alphanumeric index only that is no secondary identification, to use as a primary index. For desirable characteristic, the parcel number is only uniqueness and permanent because of its the official law or formal regulation. The parcel number system could not be simplicity for following the number on the sheet digitizing without any change. In the future, if there is any development as subdivision, condominium, the parcel identification can not be flexible for both field and official operation that is should not efficiently accommodate changes. Moreover, the parcel number is not related to

geographic location which is very stable characteristic of local government in geographic and temporal sense.

5. PARCEL NUMBERING SYSTEM ANALYSIS

Parcel identification system is essential properties to accurate valuation and provided a method for reference land parcel and assets list associated with the parcel, using number or code instead of a description. The assessor and all other assessment should investigate all tax map according to the parcel identification number correlated to the owner and all property files. The parcel numbering system is important to locate the parcel by the unique number. There are three kinds of numbering systems, which are government survey, map-base and geographic coordinate code.

When the SDO has assigned land parcel identification number as DOL's parcel identification system that is government survey. The characteristics have been uniqueness, permanence, simplicity, ease of maintenance, flexibility and reference to geographic location those are suitable for DOL, the national parcel information. The DOL original cadastral map is produced from 1/50,000 topographic map for the land survey system purpose. The SAO cadastral map as tax map is reproduced for property taxation, the parcel identification should has two parts, primary and secondary identifier (Queensland,1997). The DOL system is only primary identifier part as being the smallest area of land capable of sale without the secondary identification part as further development on that SAO administrative management.

For national administration, Thailand is a unique country divided to 73 provinces. A province is subdivided to local government called municipality and sub-district administration organisation. The parcel identification system should been showed that local government. The map-based parcel identification system should be assigned because the tax map is produced for DOL cadastral map. Moreover, the SAO has to carried on the future development and update tax map. The responsibility for assigning parcel identification numbers should belong with the SAO recorder. The recorder shall maintain a complete and accurate record of all information necessary to assign appropriate numbers. When parcel are divided or combined, new parcel numbers shall be assigned and old parcel numbers permanently retired. The SAO official should have authority to assign or change parcel numbers automatically by the computer program.

The geographic coordinate code parcel identification system is used on a geographic information system where the approximate center of each parcel is identified. It is too much accurate for SAO responsibility, the office does not work on the field if there is future subdivision. The SAO have used DOL cadastral map data for making map data for cost and time saving.

6. LAND PARCEL IDENTIFICATION NUMBER

With this recommendation, the set of numbers for SAO parcel identification number is howed for tax map based on cadastral system of DOL.

It will be comprised of the group of numbers that represent the following;

1. The first group is two numbers are assigned to the province. The provinces would be put in alphabetical order in number consecutively.
2. The second two numbers are assigned to the sub district administration organization. The SDO within each province would be put in alphabetical order in number consecutively from 1 to highest number in order, with provisions made for the creation of a sub-district administration organization.
3. The third group in four numbers which are represented the left lower corner of 1/4000 UTM coordinate sheet in kilometer for the first couple numbers in horizontal ordinate and the last two numbers in vertical ordinate for reference as base map.
4. The fourth group in three numbers those are parcel number for identification the parcel on the base map. The number is starting at 1 to the last parcel showed on the list and indexing for permanent identifier which all land data in each SAO's data system are related.
5. The last group in three numbers that represent multiple record of one land as one-to-many relationship such as condominiums . Normally it is 000 if there no multi-ownership.

How land is owned and how land is assessed for tax purposes are difference. They are related but separate functions. The parcel number would be an index number used for defining and tracking the transfer of ownership interests in parcels and it could be linked to the tax number but it would not be the tax number. The taxpayer and the tax parcel legal description, which is listed in the SAO assessment roll, is often not a good indication of the ownership interest. In addition that the parcel number would have to work equally as well over the entire country due to DOL's cadastral system being trust for jurisdiction. It is established and never changes and all subsequent legal descriptions refer back to the system. In actuality a parcel description in any conveyance can be in a variety of forms, which would affect the assignment of a parcel code.

7. THE EVALUATION

Currently, every sub-district administration organization has to provided tax map and assets list for effective property tax collection. By national specification which the SAO has to fallowed, the main topic defined that;

Tax Mapping is specific showed the parcel, building lay out, advertisement board, road, water source and the very significance place on the sub-district which is divided to zone and block for administration.

Assets list is the detail data to describe about the assets and owner on the sub-district that composed of parcel information, housing and building and commercial tag including any activities. The data have to be in the system.

There is no detail to describe what the model or system to make tax map and assets list. The only tax mapping model is only relationship of spatial data and non spatial data that SAO is creating. There is no minimum set of attributes about land parcel that is used for tax map. The land parcel identification must be provided to link not only to integrating land parcel information but also to across jurisdictional area and business process. The land parcel identification can be any form depending on each official but it must be unique identify an ownership parcel.

The reasonable land parcel identification on this paper is suggested to be the potential uses because it is source system(Nanzy, Bob, Zsolt, Bill, 2002) to obtain more information about a parcel in the data producers systems. The new data producers can be appended to the parcel identifier without disturbing current data producer's specification and across the other data set as a separate attribute. Moreover, there are two additional issues regarding data maintenance as historical information tracking and reuse or retirement of parcel identification by pointing to records in source file and databases. In addition, the reasonable land parcel identification could be nationally uniqueness number when it would be assigned from a national perspective by province and sub-district organization number national standard including latitude and longitude coordinate value of a left lower corner of original national cadastral map sheet to provide a relative location sheet.

8. CONCLUSION

With this introduction of land parcel identification has suggested to improve individual SAO recording system, with the incorporation of computer database systems in the future to share data national widely. It is believed that a main requirement for establishing a standard parcel code would be a digital map to define, track and maintain that system of parcel identification. That LPI is tied into the type of key pair for type locator and database source. The first three groups represents who is assigning the number, location and tax map department. The second two groups represents the kind of data structure, parcel locator or registration number. In this LPI suggested, tax maps trends to interrelate in cadastral systems without conflict due to the same representing with difference code. Moreover, in the context of cost effectiveness, the challenge is that considerable investments are need for the maintenance of tax mapping systems and cadastral systems compatibility.

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BIOGRAPHICAL NOTES

Vuttinan Utesnan is a lecturer at Rajamangala University of Technology Krungthep (RMUTK), Thailand. He graduated from King Mongkut Institute of Technology Thonburi, bachelor degree of civil engineering and master of art in economics from Thammasat University. He has taught in surveying courses for 22 years, currently the course is changed to surveying engineering since 2002. Most of his graduated students are working at Department of Land, that reason makes him interested in cadastral system, land administration and land information system.

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