SISTEMA DE VALUACIÓN CATASTRAL

CADASTRAL VALUATION SYSTEM

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RESUMEN

El impuesto predial es la principal fuente de ingresos propios de los municipios. Para mejorar su recaudación, es necesario actualizar sus valores catastrales, meta establecida en el Plan Nacional de Desarrollo 2013 – 2018.

La actualización de los valores catastrales en algunas comunidades del Estado de Colima, es todavía un asunto pendiente, aunado a la problemática que enfrentan los valuadores por la gran diversidad de factores que inciden en la determinación del valor de un inmueble.

Palabras clave: valoración colectiva, tecnologías web, catastro.

ABSTRACT

The property tax is the main source of income of the municipalities. To improve its collection, it is necessary to update its cadastral values, goal established in the National Plan of Development 2013-2018. The updating of the cadastral values in some communities in Colima, is still a pending issue, coupled with the problems faced by the appraisers by the great diversity of factors affecting the determination of the value of a property.

KEY WORDS: collective valuation, web technologies, cadastre.

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INTRODUCTION

This paper extracts and analyzes knowledge related to the cadastral valuation in Villa de Alvarez, which sets out issues linked to the methods of assessment and appropriate technologies for your application. The value of the property is created, maintained, altered, or destroyed by four major factors: Social: Demography, population density, social attitudes to architectural, educational or social changes. Economic: Natural resources, business trends, levels of employment, wages, prices, taxes, rates. Policies: Laws and zoning and construction regulations policy on income and credit, monetary policy.

Physical: Roads, squares, schools, temples, diversions, climate, topography, soils, mineral resources, etc.

The heterogeneity of the properties greatly influence the estimate of the value of the property. This problem involves the land valuation studies are scarce. The main objective of this work is to present a model of mass valuation which establish unit values of soil based on the installed services, using technological tools and mass valuation methods.

CURRENT STATE OF KNOWLEDGE Historical context

Historical evolution of theories of value

Below are the main historical contributions of the theory of value.

The main historical contributions to the theory of value presented.

As a first point, we will begin with the contribution of Adam Smith, who explains the foundations of the modern theory of value and income (Smith, 1985). That is, the income is not proportional to what the owner of the land has been spent on improving it, but to what the farmer can give in exchange for cultivation.

Extending ourselves with the premise of this section, we present the following contribution of David Ricardo's theory of labor value (1817). According to this, things are worth, are exchanged by prices that depend on the amount of work they have built; work is determined not only by the time production of certain goods but also by the amount of work incorporated in materials and production tools. From this perspective, the products of urban and property type would have an intrinsic value or production cost, which under normal market conditions should have the prices of individual transactions. The labor theory of value is called the conceptual basis of direct physical value; of urban valuation methodologies.

The theory of diminishing marginal value performance and lead to Ricardo income conceptualize as' the difference between the most productive capital and less productive. " That is, the more productive they are and best located lands are, the greater their profit. The concept of marginal value formation and transformation of the surplus gain in income would be the theoretical foundation of the methodology of residual land valuation, according to which land is considered the ultimate agent of production, and the owners are entitled to be paid only after other agents will have been.

Finally, we analyze the contribution of Karl Marx (1867), which criticized the Ricardian notion that marginal lands, the latest put on the market to be less profitable, do not produce income. From developing concepts of Adam Smith, that all lands even worse, produced a surplus profit, he developed the concept of absolute rent. According to Marx, in certain cases no price formation is determined by the marginal costs of production, but the specific terms of the relationship between supply and demand. Marx's theory led to the so-called comparison methodology by the market.

Thus, the theoretical to the theory of value and income contributions have been, despite their differences, a momentous significance, leading to the construction of methods and approaches for real estate valuation (Rodriguez, 1996).

History of the valuation in Mexico

During the colonial era, after August 13, 1521, Hernan Cortes decided to build a new city of Tenochtitlan. It accordance with the rules established by the Spanish legislation, commissioned the foreground Alonso Garcia Bravo, who was assisted by Bernardino Vazquez Tapia and two Aztecs. The first plane was called the Trace Cortés (Lagarda, 2009).

The distribution of land in the New Spain was made by donation from lots to the conquerors and first settlers according to their merits, within and outside the layout of the city. The first appraisal made by the City Council of New Spain took place on August 14, 1528, in which a warrant to be made 44 gold coins in Rodrigo de Pontecillos by the works he did in the city.

Don Francisco de Sedano published in 1790 a census or register with the value of the properties of the New Spain. Until then, with the exception of appraisals conducted by Andres de la Concha in 1607, those of 1629 and 1748 were carried out by professionals because of the floods, following the system of quantification of games. The remaining property was appraised by the Court of Own and Means, who was responsible for setting rents own, that is, of the inalienable lands whose rents were intended to neighbors did not suffer any assessment of public expenditure or at least that their contribution was only to fill the deficit.

In 1917, as president Venustiano Carranza, the Finance Act of the Government of Mexico City which provided, among other contributions, property tax was issued. After relating the proportions of the properties, the "batch type" which linked the land value of each property in accordance with uniform procedures and tables, which determined the increases and corresponding punishments based on the location, shape and formed dimensions of land.

The 1933 Act established farm system still used today, with individual lifts split on the grounds that the form and detail of the buildings that occupy blocks; also it designated account numbers by division of land and laid the foundations of taxation that should be taxed all land in Mexico City. For it took into account the assessed valuation, demonstrations lease, transfer notices domain, and so on. The property tax is calculated indicating the deadlines for payment and notices were formulated, taking a precise record of commercial and assessed values for urban and rural properties, from the year 1891 to today's date.

The August 26, 1944, the General Law of National Assets was published, which gave rise to the Commission of Appraisals of National Property, created on July 13, 1950 and whose functions were practicing appraisals of real estate in the intervening agencies of the federal government, for the purpose of purchase, sale, donation, on measurement of leases, payment of compensation for expropriation, damages for reasons of public interest, royalties occupation and so on.

Mortgage and trust companies in the country have been forced since to program a selection of trained professionals to practice appraisals, creating a specialty in the professions of engineer and architect, who formed the basis for the foundation in 1958 , the Mexican Institute of Valuation, promoted by architect Ramon C. Aguayo.

Since 1977, the Cadastre initiated a project to modernize and upgrade the land, a fact which marked the birth of a new generation of land in Mexico.

Currently the appraiser activity is regulated within the scope of their competence, by the National Banking and Securities Commission (CNBV), the Federal Mortgage Society (SHF), the Institute of Management and Valuation of National Assets (INDAABIN) and cadastral authorities state and municipal, which establish standards, criteria and guidelines for issuing appraisals.

Contextual framework

Works related

The evaluation procedure collective general is the process by which updated simultaneously assessed values of all properties of the same class of a municipality, in order to homogenize and reference evenly with market values (DGCE, 2006) .

Dr. (Veyna, 2006) states: "In the past, market knowledge was how to establish competitive advantages between appraisers. Today, availability and data management make the difference. This associated with the fact of not having enough of comparable makes complicated the process of mass valuation when it comes to value commercial properties rather than residential properties. This type of mass valuations still are controversial because not fail to show that intuition and knowledge of the appraiser is required: what evidence taken, consider what assumptions and how to interpret the data. "

In some European countries, collective valuation models are already a fact, as Lithuania (Bagdonavicius, 2006) and Spain (DGCE, 2006).

In Mexico, some states like Nuevo Leon and Puebla (IRCEP, 2013) have online valuation services to the general public, showing her flat floor unit values. Figure 1.

Figura 1. Sitio Web del Instituto Registral y Catastral del Estado de Puebla.

LEGAL FRAMEWORK

In Mexico the regulations governing the exercise of the assessment of federal, state and municipal, with its implementation by organizations or public agencies and the exercise of the valuation corresponds to various institutions and individuals.

At the federal level legal instruments that stand in regulating the exercise of the assessment they are:

- The Tax Code of the Federation in Article 4 of its rules.
- Law on Income Tax Article 155 (Income Tax ISR).
- Credit Institutions Act.
- General Law of National Assets, published in the Official Gazette on May 20, 2004, Title VI, Chapter unique.
- Transparency Act Housing Credit Guarantee, published in the Official Journal of the Federation on June 30, 2003.
- Mexican Standard NMX-C-459-SCFI-ONNCCE 2007 - Rating Services, Statement of implementation published in the Official Journal of the Federation on September 13, 2007.
- At the state and municipal level are:
- Constitution of the United Mexican States, Article 115 (Property Tax).
- Cadastral Law of the State of Colima.
- Valuation Act for the State of Colima.
- Regulations for the development of tables of unit values of land and building for the city of Colima.
- Regulations for the development of tables of unit values of land and building for the municipality of Villa de Alvarez.

THEORETICAL

DEFINITION OF GOOD

Well in terms of valuation

The Mexican standard of valuation services states that any good or service obligation that is within the assets of an individual, moral or any other entity without legal personality is a good in terms of valuation (ONNCCE, 2007).

Real urban nature

They are distinguished as urban construction land and a population center.

Basic Construction

They are works that allow immediate use of urban land belonging to the urban reserve, and make (State Government of Colima, 1997):

- Potable water service;
- Ability to download the wastewater collection;
- Ability to connect to the grid; and
- Integration into the existing road structure.

DEFINITION OF VALUE

Physical quality that is appreciated in a well. Property characterizes economic assets and forms the basis of their exchange (Nuñez Scarpellini, 2009).

Economic concept which requires the amount in monetary terms that he deems the property subject to valuation, according to their utility, supply and demand on a given date (ONNCCE, 2007).

Valuation approaches

Approach or physical costs

To determine the value indicator for this approach is necessary to quantify the physical and economic well-matter of valuation characteristics as well as its replacement value or reproduction subsequently by relevant factors affecting it demerit by age, conservation and maintenance, as the economic, functional and technical obsolescence. The appraiser must describe in the report the nature of valuation applied demerits (ONNCCE, 2007).

Capitalization approach or income

To determine the value indicator for this approach is necessary to quantify the profitability of the asset valuation matters, as well as the capitalization rate of interest or discount applicable to the case. This approach is determined based on the principle of anticipation and the principle of best use.

For purposes of determining the profitability of an asset it should be determined if the rent is constant or variable defining the characteristics of this variability in their case as well as the economically productive life of the well field of the valuation and the likely recovery value.

This approach is applicable to linked to economic exploitation and production units economically indivisible elements, but not its components separately.

The indicator value obtained by applying this approach should be seated in the valuation report as Market Capitalization Income or (ONNCCE, 2007).

Comparative market approach

To determine the value for this indicator approach is needed inquiry securities offered prices for similar or identical to the good stuff valuation, quantified, if any, differences between comparable mentioned or comparable items sold and While valuation matters by specific factors.

This approach reflects the amount of exchange of good material valuation in a specific market, and is the basis for valuing the majority of the assets and rights to market economies.

The indicator value obtained by applying this approach is based on the valuation report as Market Value (ONNCCE, 2007).

COLLECTIVE ASSESSMENT PROCEDURE

The evaluation procedure collective general is the process by which updated simultaneously assessed values of all properties of the same class of a municipality, in order to homogenize and reference evenly with market values (DGCE, 2006) .

In a process of collective valuation, business planning is particularly important due to the complexity that this entails. This complexity lies in the following factors:

- It is a process that lasts for a relatively long period in which it must develop different consecutive phases.
- It is a procedure that requires having a basic information and documents (urban planning, cartography, etc.) that will be provided in advance.
- Is a procedure involving an important, both internal (with involvement of several areas of the town hall) and external (estate agents, development companies, etc.) number of agents.
- A procedure which has very strict legal deadlines to be met.

TECHNOLOGY TOOLS USED FOR THIS PROJECT

PHP: It is an interpreted programming language originally designed for creating dynamic web pages.

HTML5: It is considered the product of the combination of HTML, CSS (Cascading Style Sheets) and JavaScript. These technologies are highly dependent and act as a single unit organized under the HTML5 specification (Cobo Gomez, 2005).

MYSQL: (Database Management System, DBMS) database is the most popular open source world, provided by MySQL AB. This language allows to create databases and add, manipulate and retrieve data based on specific criteria (Cobo Gomez, 2005).

CONTENT

ASSESSED VALUATION

The assessed value is the value that is determined by applying current values tables and technical procedures established by the Cadastre (DGCEJ).
The value table is the set of elements and unit values approved by the land law contained in the plans of populations, areas and divisions regarding the unit value of land and construction unit values according to classifications and other Elements to be taken into consideration for the valuation of both urban and rustic lands in accordance with technical standards adopted for this purpose.

To determine the table of unit values as (DCMVA, 2001), provides that the unit values are presented per square meter of surface applied to the street where it is located, considering the services that this count, such as: type of pavement , sidewalk, water network, electricity network, drainage, street lighting, telephone, clean services, security, traffic, quality of buildings, public buildings nearby, density and commercial, industrial, residential quality in its various types, religious centers, schools and other indicators of the level of development.

To set this procedure is necessary to have the following information before you register or update the unit value of the soil:

Required information:

- Urban Development Plan
- Zoning Plans
- Cadastral map
- Study of the real estate market in the area to value.
- Technical details of the construction unit prices applicable to the area to value.
- Zoning Regulations

Procedure applied to determine the value of street based on the guidelines established by Regulation (DCMVA, 2001) of the municipality of Villa de Alvarez

This section is designed to determine the logical and mathematical sequence to be followed to determine the value of street based infrastructure services installed. The analytical method provides an option to calculate the value of the plots of land where the streets have all or partiality of Municipal Services (Cantu, 2007). Figure 2.

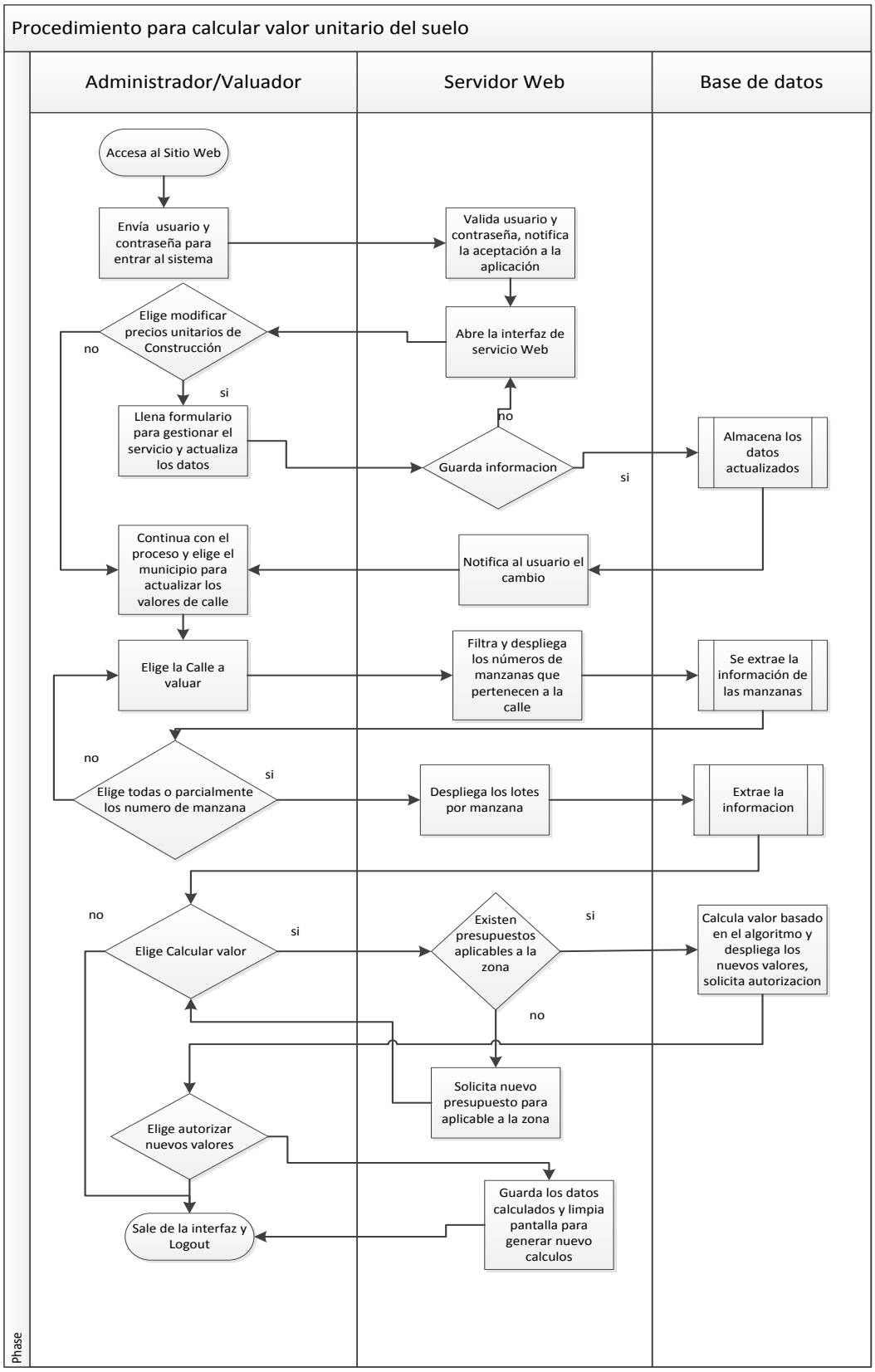

Figura 2 Procedimiento de valoración de valores unitarios de suelo (secuencia lógica).

Based on the above scheme, we can recommend the following automated interface in PHP programming language. Figure 3:

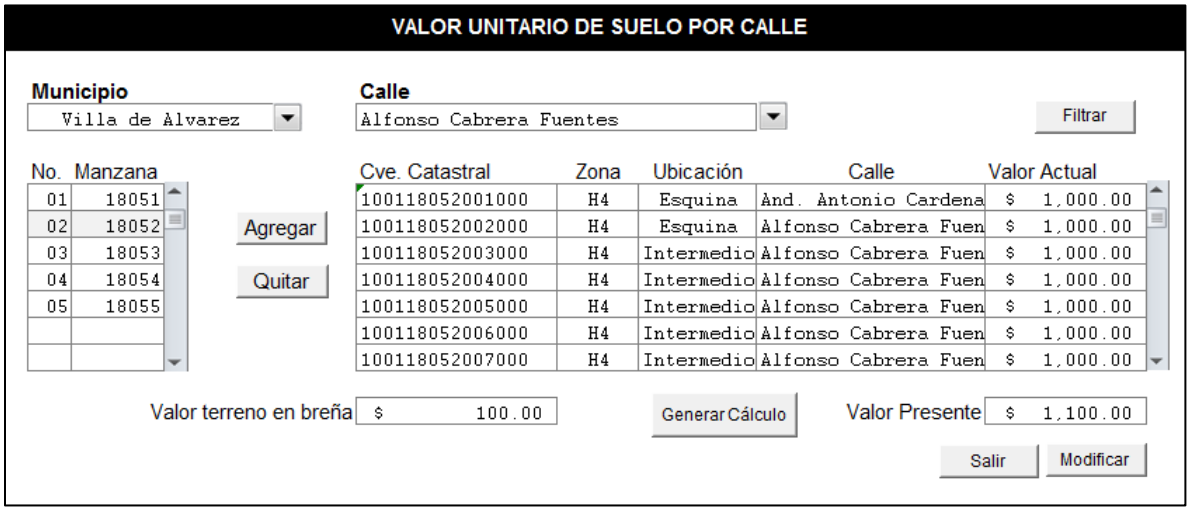

Figura 3 Interfaz de valoración masiva por nombre de calle.

That is, the site administrator or user with access to the program may choose the name of the town and street you wish to value, as well as choose apples that street in order to apply the present value, as shown in Figure 2 .

To generate the calculation of the unit value of land for the selected street, the user must press the button labeled Generate calculation in the algorithm shown in Figure 4 is applied.

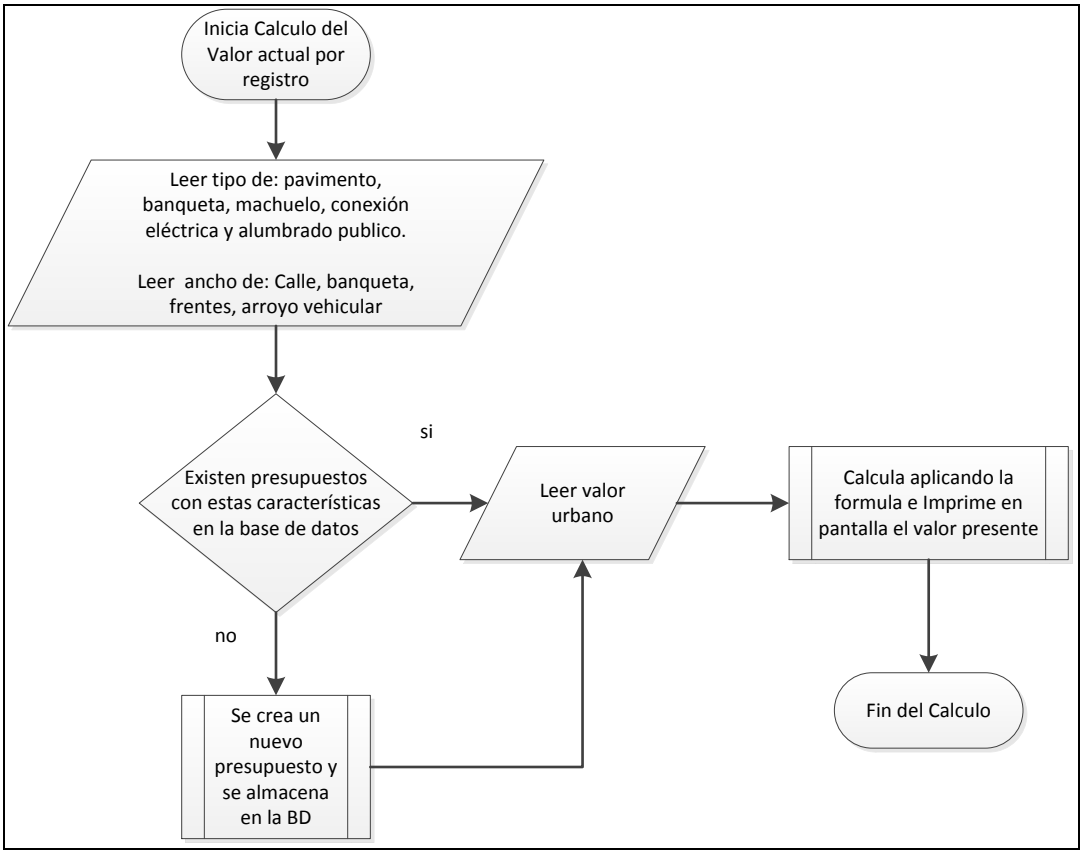

Figura 4. Algoritmo para calcular el valor unitario de suelo.

Mathematical procedure used to determine the unit value of land

This section presents the formulas used to calculate the unit price of the land.

$$STV = VUTB + UCC \quad (1)$$

Where:

STV = total unit value of land

VUTB = Unit value of land in breña

UCC = total value of installed services

Value of land in breña

They are the natural state land that have not been used for crops or improved buildings.

Total value of installed services

The purpose of this project is not set prices that must have each of the overhead and underground lines of municipal services installed in different urban centers and towns of the country. Rather, it is to establish the procedure for estimating the physical value and the market value of the streets, considering the different options presented to have the same or different municipal services installed.

Being a mathematical method must be established as comparative base list price of different concepts of work required for installation of the various subway lines and air services. This in order to transform an area in urban breña and make lots with all services installed. Figure 5.

PRESUPUESTO URBANIZACION		
C O N C E P T O	**COSTO/M2**	
Costo por Estudio de Impacto Ambiental	$	40.00
Levantamiento topográfico y Proyecto	$	15.00
Costo por Estudio de Impacto Ambiental	$	20.00
Trazo, Nivelación y Lotificación	$	45.00
Despalme terracería	$	35.00
Agua Potable	$	65.00
Drenaje Sanitario	$	57.00
Energía Eléctrica	$	80.00
Alumbrado Público	$	75.00
Pavimento Asfáltico	$	140.00
Guarniciones de Concreto	$	95.00
Banquetas de concreto simple	$	225.00
Nomenclatura, Señalamiento y Parques	$	50.00
Teléfono	$	65.00
Imprevisto	$	12.00
COSTO TOTAL DE LA URBANIZACIÓN =	**$979.00**	
VALOR DE TERRENO EN BREÑA	$	100.00
VALOR DE TERRENO CON SERVICIOS		$979.00
VALOR CALLE X M2	$	1,079.00

Figura 5. Ejemplo de Presupuesto de Urbanización

The unit value for installed services is obtained by adding all the services included in the budget per square meter of area to value, Figure 5. From the above quote can determine the value of the land. An example would determine the value of the middle ground of a surface of 126 m2. After calculating the value you get $ 137,410.56.

CASE STUDY RESULTS

In this section we discuss a case of mass valuation in the city of Villa de Alvarez, Colima. The first step is to define the study area. Figure 6.

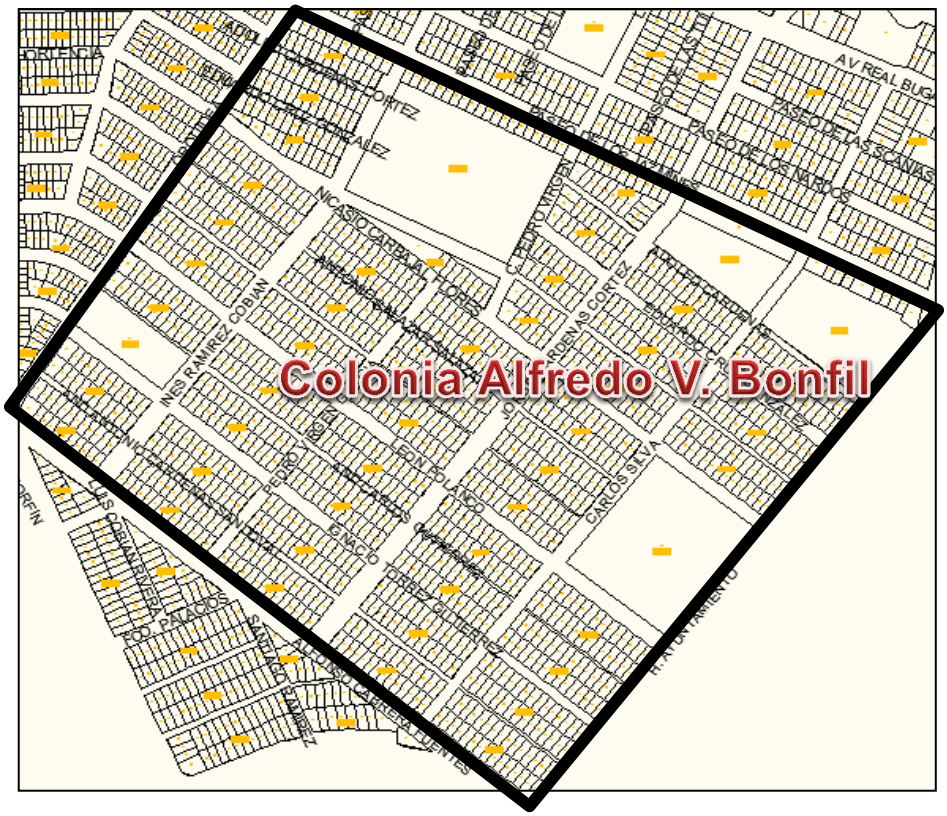

Figura 6. Mapa catastral de la colonia Alfredo V. Bonfil en Villa de Álvarez, Colima.

In this case he chose the colony Alfredo V. Bonfil in the municipality of Villa de Alvarez, Colima. This colony is considered a popular area with a population density detached high of 295 inhabitants per hectare, built with consolidated housing, infrastructure and sufficient equipment, representing 59 dwellings per hectare, home manufacturing, type of asphalt pavement on streets, concrete sidewalks with planters (Colima State Government, 1997). Figure 7.

Figura 7. Fotografía de calle en la colonia V. Bonfil en Villa de Álvarez, Colima.

Land valuation

To evaluate the urban land in this area to some specialist construction company in that branch to the development budget per square meter is requested. To do this, you are provided with the topographic map data apples terrain, division of lots for the cost of the residential sewer connections and the width of the streets and sidewalks, diameters and characteristics of underground water pipes potable, sewer, natural gas, storm drainage if required, electrical energy that can be underground or overhead, phone that can be underground or overhead, street lighting, concrete curbs and asphalt pavement or some other material coating.

It shall also provide material specifications for each of the lines of services and for connections and downloads, type of subsurface material and its characteristics, obtained through laboratory soil mechanics.

The manufacturer provides the breakdown of the overall budget the list of materials and their characteristics, physical value of $ 979.00 per square meter, Figure 5, to the streets Alfonso Cabrera Fuentes, Ignacio Torres Gutierrez, Leon Polanco, Nicasio Carbajal Flores, Francisco

Palacios. And of $ 860.56 per square meter, Figure 9, for walkers Antonio Cardenas Sandoval, Carlos Gutierrez, Antonio Salazar Salazar, suitable for the area.

PRESUPUESTO URBANIZACION		
	C O N C E P T O	**COSTO/M2**
	Costo por Estudio de Impacto Ambiental	$ 40.00
	Levantamiento topográfico y Proyecto	$ 15.00
	Costo por Estudio de Impacto Ambiental	$ 20.00
	Trazo, Nivelación y Lotificación	$ 45.00
	Despalme terracería	$ 35.00
	Agua Potable	$ 65.00
	Drenaje Sanitario	$ 57.00
	Energía Eléctrica	$ 80.00
	Alumbrado Público	$ 75.00
	Banqueta	$ 225.00
	Guarniciones de Concreto	$ 95.00
	Nomenclatura, Señalamiento y Parques	$ 50.00
	Teléfono	$ 65.00
	Imprevisto	$ 12.00
	COSTO TOTAL DE LA URBANIZACIÓN =	**$839.00**
	VALOR DE TERRENO S/SERVICIOS	$ 100.00
	VALOR DE TERRENO C/SERVICIOS	$ 860.56
	VALOR CALLE X M2	$ 960.56

Figura 8. Ejemplo de presupuesto de urbanización para calles tipo andador.

As a next step investigate the values in the market for lots that do not have facilities for this type of urban area. As data, it extracted $ 100.00 per square meter for land breña .; therefore, it is estimated that the unit value for the street is as follows:

$$VUT=VUTB+VUS \qquad (1)$$

Valor de calle = $979.00+$100.00.

Valor de calle = $1079.00 el metro cuadrado para las calles.

Valor de calle = $ 960.56 el metro cuadrado para los andadores.

However, to calculate the individual value of each field would have to rely on the number of fronts that this is by applying the following formula used in (Municipal Cadastral Technical Council, 2006).

$$Valor\ Unitario\ Catastral =$$

$$\frac{Longitud\ del\ frente\ especifico\ 1}{Suma\ de\ frentes}\left[Valor\ de\ calle\ del\ frente\ 1\right] + \frac{Longitud\ del\ frente\ especifico\ 2}{Suma\ de\ frentes}\left[Valor\ de\ calle\ del\ frente\ 2\right] + \cdots \qquad (2)$$

Aplicando la formula anterior se obtienen los siguientes resultados. Figura 9.

Cve. Catastral	Zona	Ubicación	Calle	Valor Actual
100118052001000	H4	Esquina	And. Antonio Cardena	$ 1,045.80
100118052002000	H4	Esquina	Alfonso Cabrera Fuen	$ 1,079.00
100118052003000	H4	Intermedio	Alfonso Cabrera Fuen	$ 1,079.00
100118052004000	H4	Intermedio	Alfonso Cabrera Fuen	$ 1,079.00
100118052005000	H4	Intermedio	Alfonso Cabrera Fuen	$ 1,079.00
100118052006000	H4	Intermedio	Alfonso Cabrera Fuen	$ 1,079.00
100118052007000	H4	Intermedio	Alfonso Cabrera Fuen	$ 1,079.00

Figura 9. Ejemplo de los resultados obtenidos

CONCLUSION

One of the advantages of this project is the best use of time allocation unit value of streets and collaborative work in the network by different agents, specialists in the field.

With this work we show that it is feasible to reduce the time it takes the development of assessed valuation if technological tools and mass valuation model used.

This project represents a hotbed of automated processes for valuating practice.

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