The Cadastre in Spain

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The Cadastre, or to put it more correctly, the cadastre model that each country adopts, is no more than the result of having chosen a specific option from amongst various possibilities. It is evident, especially if we are in a democratic state, that choosing one cadastre model over another means coming to a decision, which must suit the circumstances and the objectives in that society. During this presentation, we will provide a comprehensive summary of what the Cadastre is like in Spain today. But first of all, allow me to refer briefly to the history behind the institution here, which will help us to understand more clearly why we are where we are.

In Spain, as elsewhere in Europe, the Cadastre has predecessors that date back to the Roman Empire or even earlier. But it was not until the 18th century when the absolute monarchs were recognized to have, amongst their many other powers, that of investigating the properties of their subjects and levying taxes on them, to sustain the crown’s expenses. The absolute monarchs were recognized to have, amongst their many other powers, that of investigating the properties of their subjects and levying taxes on them, to sustain their expenses. It was in such a context that the Cadastres de Propiedad were carried out in Catalonia in 1715, and the Cadastre de Ensenada in the rest of the country from 1749 on. Experts have defined the work inspired by the Marquis of Ensenada as a colonial enterprise. The Cadastre de Ensenada was the first serious attempt to establish a system to fairly distribute the tax burden according to people’s real wealth.

During the 19th century, the Cadastre became the key to fiscal equality. A long fight was initiated to create it. It was an important element on the liberal and democratic agendas and formed part of all general process to modernize the country. However, the more conservative forces, linked to the particular interests of the land-owning elite, always resisted such plans. If the government wanted to have a Cadastre to share out taxes equitably and put a stop to the fiscal fraud of landlords whilst freeing the paupers from excessive taxation, they had made a substantial investment into the operation. They needed a network of Administration agents to reach the furthest corners of the territory to measure parcels, inspect sales deeds, establish quality, prices, etc.

In 1845, the minister Alejandro Mon brought in a tax reform importing the French taxation model to Spain. This led in 1846 to the design of the Estadística de la Riqueza, the wealth statistics, a first step towards a full-fledged Cadastre. However, the more conservative groups in the Moderate Party took it upon themselves to stop things going any further. Instead, they came up with the idea of the Amilcarasientos, a system used to distribute tax quotas until well into the 20th century. The amilcaraciones (literally into thousands) consisted of a declaration made by the owners of any estate, in which they gave not only its surface area, but also its value and a description of its use. The high incidence of fraudulent declarations led to a somewhat unacceptable and massive loss of cadastre information.

The system of sharing out the tax burden by quotas was unfair and unequal and fiscal fraud was systematic. Its permanence introduced to Spain the generation of an attitude of turning a blind eye to fraud, which consisted purely and simply in hiding properties from the tax collector. As better maps were drawn up of the land, this became increasingly difficult. But the landlords were powerful enough to continue defrauding the tax collectors regarding the value of their lands and the sharing out of the quotas.

The first attempt to create a reliable data base took place over the period from 1965 to 1974. It was called the «Avance Catastral» (Catastral Advance), which included topographical measurement of uniform farmed areas and settlements, with rough sketches of the parcels. The second was the complete topographic cadastral of the parcels, «Catastro Topográfico Parcelario».

With the invention of aerial photography, the «Avance Catastral» was finished at the end of the 70s. Since the aerial photographs provided objective mapping which would break any argument shifted to accredit in the classification and quality of the land. The realization that fraud continued to flourish led to further reforms, which still failed to overcome the low quality of the Spanish Cadastre.

A final attempt to create a reliable data base took place over the period from 1985 to 1994. It was called the «Catastro Parcelario de España» (Spanish Parcel Cadastre) was the outcome of consensus between the conservatives and liberals. Finally, in 1990, a new Cadastre Law was passed, which was the immediate predecessor of the current legislation. It stipulated that the cadastre should be drawn up in two stages. The first was the «Avance Catastral» (Catastral Advance), which included topographical measurement of uniform farmed areas and settlements, with rough sketches of the parcels. The second was the complete topographic cadastral of the parcels, «Catastro Topográfico Parcelario».

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In Spain, the prevailing Constitution guarantees the regions’ and the municipalities’ rights to autonomy, although the municipalities’ rights are somewhat more limited. There are, therefore, three clearly differentiated levels of administration: State, regional and local, each with its own organs of government and its own powers or competencies, many of which differ according to the type of province.

Defending the argument that cadastral management should be one of the State powers does not require any logical acrobats. It seems natural that the work of managing and maintaining the Cadastre, which is based on the information at the source of various fiscal, economic and legal actions, involving the interests of many different public administration organs, should be a nationwide State-run scheme.

Some kind of higher or supraregional interest should prevail. Its consolidation as a State function is not only justified by the State powers in the area of economy and finance in general, but also by the need to guarantee the equality of impact on all citizens throughout national territory and on a wide range of sectors, which requires a high level of uniformity. We believe that there are also obvious reasons of economy and efficiency which scarcely need to be mentioned.

This was the reasoning behind the design of the cadastral model, which was to cover 7,572 municipalities, in which there were 22 million urban real estate assets and 43 million real estate assets within an area of 50 million hectares.

It was decided that the design and monitoring of the process should be highly centralized, while the management and maintenance of the cadastral data base should be strongly decentralized. The Ministry of Economy and Finance, working through the Directorate General of the Cadastre Management and Tax Co-operation Center (Centro de Gestión Catastral y Cooperación Tributaria) set up a network of 16 regional offices, which in turn coordinate the work of 65 Territorial Administrations with a provincial and/or local scope. All these Administrations were structured and fitted out as centers for producing and conserving the cadastral of their own territory. They were to work according to identical parameters, using the same tools and being obliged to obtain the same quality levels. This is the way to guarantee the equality and standardization that we referred to above.

This organization is made up of people, who are all its main asset. At present, the Cadastre has a staff of 3,200 employees, of whom 2,000 are working in the central office in Madrid, on management and control, whilst the rest are in the provincial or local offices, working on production. This means that only 6.2% of the total staff are involved in administrative management.

The professional qualifications of the staff is another outstanding characteristic within the model. 1,500 employees (47%) come from a technical background. These include 351 architects, 284 agricultural engineers, 156 computer experts, 236 cartographers and 498 specialists from other fields. The rest of the personnel (53%) are trained as auxiliary and backup staff. Their work shows the multidisciplinary nature of any cadastral activity, going far beyond the old concepts that considered it work for topographers and geographers.

All the personnel receives intensive training at their different levels, according to their job profile. Ongoing learning and permanent training is not only a way of enhancing their technical know-how but also to stimulate people to do their best with a view to promotion within the organisation.

Taxation

Spain, as a Mediterranean country, has a Cadastre based on the Napoleonic or Roman legal concepts that see it as a basis for tax activities. It was the need to have an instrument to guarantee the principles of justice and equality in sharing out the tax burden that first led to first a mere list of landowners and later a detailed description of the properties owned. It is this background that means that the Cadastre does not even attempt to substitute the Land Registry, but rather acts in a complementary role to it, mutually exchanging help and information.

The way that the Cadastre fits into the taxation scheme in a country is valuable in one aspect in particular: since it serves to fix economic obligations that fall upon citizens, the citizens have the right to demand from it a high degree of quality and veracity, so that no erroneous or incomplete data should force them to pay greater obligations than they legally are due for.

At the end of the day, the citizens' demand leads to greater quality in the cadastral data base.

Moreover, within the territorial model just described, the three different levels of administration (state, regional and local) each manage and collect their own taxes. The Spanish Cadastre has direct and indirect links to six taxes. At local government level, it is linked directly to the «Impuesto sobre Bienes Inmuebles» (property tax) and the «Impuesto sobre el Incremento del Valor de los Terrenos de Naturaleza Urbana» (urban property capital gains tax). At regional level, the «Impuesto sobre Transmisiones Patrimoniales» (capital transfer tax) and «Impuesto sobre Sucesiones y Donaciones» (inheritance and gift tax) use the cadastral value to establish the tax base. And (finally, at state-wide level), the cadastral value serves to fix certain obligations on citizens under their «Impuesto sobre la Renta de Personas Físicas» (income tax) and the «Impuesto sobre el Paronómico» (wealth tax).

Working with other Public Administrations, Noarres and land Registry

The third main characteristic defining our model is that it is not exclusive, but includes different levels of participation for each of the Public Administrations and other agents involved in land ownership information.

The Public Administrations work in the Cadastre management in a different way, with local administrations participating more actively than the regional ones. Basically, it is a voluntary model under which special outsourcing contracts are signed with the local councils and the provincial government bodies, so that they take on functions ranging from simply supplying information to delegating full exercise of certain competences of the cadastral activity.

There are already 1,145 municipalities working within this model of layered activity, covering seven million urban units, i.e. 30% of the total nationwide.

Following a similar line of cooperation, there are also out sourcing agreements with the regional Notaries professional associations. Under these agreements, the Cadastre is directly informed of all transfers of real estate made before Notary. This serves two purposes: firstly, it relieves the owner of the obligation to declare any change in ownership and secondly, the Cadastre is permanently updated with the new information on property ownership.

This integral design has meant a set of technical, legal and computer tools have had to be set up to give the Public Administrations and other social agents access to the Cadastre and to facilitate their part in running it, providing them with suitable information channels. This means that information is sent immediately in real time and that management is more efficient, since with the cooperation of different administrations and social agents the cadastral data base can be updated as quickly and as exactly as possible.

The Cadastre is Computerized and Multifunctional

The fourth characteristic of the Spanish cadastral model is the key role played by information technology in it.

It seems obvious that in the era in which we live, the state of the art in computer hardware and software will condition the way we do things, at work, at home and at leisure. The cadastral model could not stand outside this historical context, as it had done until 1982, when we began to develop the model we are describing here. After all, the Cadastre was basically a straightforward data base, and it would be inconceivable for a modern cadastral not to be computerized, somehow or other.

Given this situation, when we speak of the high degree of computerization in the Spanish Cadastre, we are not simply referring to the fact that it is stored on a digital support medium within a computer. We are referring to something much more specific: that all the activities revolving around the Cadastre as a whole, with all its different variables and changes, are impregnated with the working methods and criteria that derive from what we can call information technology culture.

This is clear in various different aspects:

Firstly, creating and maintaining the Cadastre as a computerized data base, as we saw above.

Secondly, information technology in our organisation is articulated through two basic tools for managing data:

- A geographical information system, especially designed by our developers to meet the management needs of the Cadastre. This is known as the «Sistema de Información Geográfico Catastral (SIGCA)».

- A system specifically for managing information, which captures, maintains and exploits data. This information manager is known as the «Sistema de Información de Gestión Catastral».

The information management is characterized by linking up different kinds of information. A range of
formats have been established and are fully operational, for exchanging data between Public Administrations, Notaries and Land Registrars. These serve as a vehicle for downloading and uploading enormous volumes of information. However, for the moment we have not yet reached the stage of instant information transmission.

To such end, each of the existing Territorial Administrations is configured as a data processing centre, and has all the necessary hardware and software to handle all the information in its field of action, whether alphanumeric or graphic.

To conclude the analysis of this key characteristic, I would just like to give you some statistics, which I think amply demonstrates the importance of information technology in our organisation. At the moment, we have 2,300 terminals for a total staff of 3,200 employees. This is a ratio of 1.4 people per terminal.

**Maintaining the Cadastre**

As I said above, all the organisation’s current efforts are invested in keeping the cadastral data base alive and updated, in order never to have to create it again from scratch.

Along this line of work, all the media and resources to which I have referred are directed towards handling information which is continuously being changed.

The different changes that real estate undergoes are of both a physical and a legal nature, due to change of ownership, surface area or crop use, or perhaps because new constructions have been built or old ones knocked down. All these generate a constant flow of activity for the Cadastre Administration workers. We can get a clear idea of their work loads by analysing the figures in the chart, showing how many dossiers were handled in 1995 (see chart on p. 13).

There are 3,000 persons working in the Territorial Administrations, so the number of dossiers handled per employee is 1,350. Apart from these data, during 1995, over 2,355,000 verbal and written queries were preserved by citizens requesting information or asking for clarification.

**Conclusion**

To conclude, I would like to give you a summarized idea that shows the kind of investment the government has had to make to get the results I have described.

The Cadastre in Spain has been drawn up by services companies, under the overall management of the Ministry of Economy and Finance. The Directorate General established the technical conditions for under, defining the deadlines for development, establishing the technical specifications, and the criteria for monitoring the work and controlling the final quality of the product.

The services companies, both publicly and privately owned, actually carried out much of the work needed to create and update the Cadastre. They did the aerial photography, restitution, orthophotography, digitalizing the cartography, collecting field data, etc. All in all, the ancillary work of collecting, preparing and screening the information prior to its delivery, when it is subjugated to due processes of quality control and validation before it is put into the actual data base. The

**Directorate General, actually, has made all the work that entailed altering the cadastral data base, including (and very significantly) the allocation of a value to each of the existing real estate assets.**

The needed investment to elaborate the cadastre may seem very high, especially for some of the nations represented here who are designing models to develop their own cadastres. However, the investment needed will depend on other factors that each country will have to consider when defining its own model, such as how long they have to make it and the scope of needs to be covered. Costs will vary accordingly.

There are many arguments that can help to justify this kind of investment. If one links the Cadastre to the establishment of real estate taxes, the yield on investment is not only immediate but also quite outstanding. As an example, last year in Spain, 493,831 million pesetas were collected for the “Impuesto sobre Bienes Inmuebles” (property tax). Moreover, the efforts put in to creating the cadastral data base have made it possible to boost the amounts collected from 146,799 million pesetas (1,203 dollars) at the beginning of the process to 493,831 million pesetas (4,048 million dollars) in 1995, i.e. bringing about an increase of 336%.

It is, therefore, evident that investment in the Cadastre immediately generates economic resources for the Public Administrations, which is an objective that should never be forgotten when designing a model. It should also be remembered that, since it is related to taxes imposed on real estate, the level of fraud is very low, since it is materially impossible to hide such assets, especially now aerial photography is so ubiquitous.

I should not fail to point out the social profitability deriving from such operations. An up-to-date Cadastre, accessible to all the Public Administrations and citizens, is the ultimate support to greater legal certainty in real estate transactions. It is a key instrument in facilitating policies for planning and developing infrastructures and diagnosing basic citizens’ needs. It is also a decisive tool for urban and territorial planning, whilst it makes it possible to obtain all kinds of by-products from the information, such as a census of publicly owned real estate, or of certain kinds of crops, or instead of having to go for them on a piecemeal basis, as happens in so many countries.

To conclude, I would like to make a final comment about what I have been telling you. Evidently, economic profitability is one of the main constraints when adopting any policy decision, and therefore, any project that want to be put into operation should take such profitability into account. However, economic reasoning, as I see it, should not be the make-or-break factor in the decision. A Cadastre that is an efficient base of land information, whatever model is chosen for its configuration, is one of the characteristics defining a modern State. Its positive effects go beyond the purely economic realm and are manifested in many aspects where they can be seen to be necessary. I would therefore encourage anyone thinking of drawing up or developing the technical specs for cadastral data to take on the project with maximum enthusiasm, since they are without a doubt thereby making an efficient contribution to the development of their country.

**Coincidences and Differences of Cadastral Systems in Countries in Transition and in Latin America: Running Projects**

JORDI GUIMET PERERA Regional Manager of Cadastres SPAIN

**Latin American Countries**

All Latin American countries have some type of cadastral and a goodly number have cadastral organizations that date back many years, in some cases back to the last century. This does not mean, however, that the cadastral systems have been thoroughly implemented. The great majority of the countries will lack a proper cadastre with national coverage.

The most common situation is that of a rustic or rural cadastre, created primarily for basic knowledge and planning of natural resources. It is usually run directly by the Central Administration. Along with this "national" cadastre, there are also a multitude of municipal cadastres, created by the town councils for fiscal reasons. On numerous occasions, one can find other "cadastres" also belonging to the Central government, dedicated to specific subjects such as mining or forest activities.

Some countries with a significant technical tradition (part of Argentina, Chile) where in the past quality partial cadastres or general inventories have been done, or where a significant effort has been made recently with positive results (Mexico). But the majority have only made one-off efforts or have never given much priority to the subject.

**Eastern and Central European Countries**

These countries can be divided into two major groups, according to the kind information held at the start of their transition to a market economy regime.

The first group consists of Russia, the Ukraine and Belarus, i.e. those countries more tightly incorporated into the Socialist Soviet regime. The second group consists of the rest of the Central and Eastern European...
countries which the regime incorporated after the end of the Second World War (Czech Republic, Hungary, Poland, Croatia, Slovenia, Bulgaria, etc.). At the start of their changeover to new economic regimes, the first group had full and complete cadastres. These were land inventories mainly oriented toward the planning and control of agriculture production. Cartography and information detailing agricultural characteristics of the land (surface as well as sub soil) demonstrate a detailed and exhaustive analysis of the uses and conditions of the land. However, in the last few years the cartographic documentation has become outdated. Generally, various organisations are involved in the production, maintenance and analysis of the cadastral documentation at local, regional, and central levels with a clear division of responsibilities in everything relating to land and urban areas.

The second group also have cartographic and documentation information with characteristics similar to the first group. However, over the last few years they have evolved a cadastral organisation and land registry that, although incomplete and lacking legal recognition, need to keep the cadastre up to date. There are several political, cultural, and historical reasons for this. This group initially began with a better level of information to generate a cadastre, as well as a more clearly defined model of the project to implement.

Objectives
Latin American countries
The existence of a plurality of cadastres generates a plurality of objectives, to which are added the differences resulting from the various technical, legal, etc. trajectories of each country. In the case of urban cadastres it is clear that the main short-term objective is fiscal. The desire for improved real estate tax management seems to be the reason shared by the great majority of these countries, although not the only one.

In the case of rustic cadastres the objective also seems to be fiscal, but it coexists with the necessity for counting on an information base reliable enough for planning and managing natural resources.

In some cases the necessity for the cadastre has become obvious because of large reform projects aimed at agricultural structures (Costa Rica, Honduras, Venezuela) or processes of occupation and privatization of public lands (Mexico). The need for a reliable information base contained in the Land Registries seems obvious not only in these countries already cited, but also in others such as Chile, El Salvador, the Dominican Republic, some Argentine provinces, etc.

The majority of countries are planning cadastral reform. All are embarked, to a greater or lesser extent, on broadening the scope of their present cadastres, and all aspire to a multi-purpose cadastre.

Eastern and Central European countries
Mirroring the two types of situations described above, which are at the root of the different objectives, here too, there are also two main sets of nature-objectives, arising from the transition to private property systems and market economies.

The first group of countries (Russia, The Ukraine, and to a lesser degree Belarus) are clearly oriented toward privatization and distribution of the land, while the second group give priority to the restoration of property (along with the alternative, compensation), along with the privatization of collective farms and distribution of the land. In both cases the creation of a modern cadastre is tied to the legal system of land registry, and which should be high priority in all cases given the need to register privatization, distribution, and restitution operations.

In general terms, a multi-purpose cadastre is seen as a good idea, supported by new information technologies (computisation, digital cartography). It requires strong investment, a long time for its execution, and to train specialists in the various disciplines related to cadastral systems and land registries. As for the fiscal aspect, while not neglecting its importance, few steps have been taken to date.

Legislation
Latin American countries
The majority of countries have specific cadastral legislation, some dating back to as early as 1817 or the beginning of the century. In certain cases there are no major guidelines other than the generic provision for the existence of a cadastral under local regime regulations. Some countries have recently introduced modifications, and many are revisiting their cadastral legislation in order to shape it to the new requirements for implementing a multi-purpose cadastre.

Experience seems to indicate that existing regulations in many cases have been inadequate and are poorly applied, judging from results obtained to date. It can generally be said that those countries which lack cadastral legislation find themselves lagging behind in implementing their cadastres.

Eastern and Central European countries
It seems self-evident that the initial formulation of political changes should be the promulgation of laws that boost market development by establishing rules and conditions. The Administration will be reorganized in order to favor such objectives.

Also, with few exceptions, the creation of a legal framework has been and continues to be a complex process, confusing, and in many cases more arbitrary than positive, given the difficulties of all types that surface during a period of transition.

Administrative organisation
Latin American countries
Generally speaking the state holds legislative responsibility, although in the case of a federal system such as in Mexico, the legislation is in the hands of the federal entities. Except for federal states the central government normally assumes some functions of creating cadastres, with the clear exception of counties like Peru where it is almost exclusively in municipal hands.

The distinction between rustic and urban cadastres usually carries a parallel split in responsibilities. Generally, the rustic cadastre is central government's responsibility and the urban the municipal administration. Municipal competence does not entirely preclude central administration involvement, as there are many occasions when the national government establishes common regulations, or technical and economic co-operation programs for implementation in municipal cadastres.

In a goodly number of cases the cadastre falls under the Ministry or Department charged with public finances, although if a rural cadastre exists it is assigned to the Ministry of Agriculture. In some cases the cadastre is integrated into the Ministry of Public Works, Urban Development or its equivalent (Bolivia, Mexico), and one is found in the Ministry of Justice (Costa Rica).

Eastern and Central European countries
This area is the most problematic of the reform measures and illustrates the generally poorly defined situation, with few exceptions, in the structural formation.

There is a clear distinction in the concept and development of urban cadastres versus rural cadastres. Rural cadastres are favored, possibly due to the historic sense of land amongst country people, as well as the greater complexity of the privatization and distribution of unparceled rural property.

The long awaited integration of the Registry and the Cadastre, in some countries already defined and operative, is hampered by a lack of clear legislation. Among other factors, this is due to political struggles for influence between governmental ministries.

The conception of a unitary, uniform cadastre is difficult to make reality, again due to turf battles between large cities and the ministries responsible for these functions. The scarcity of financial resources in the central organisations also compels them to delegate these functions to the lower-level administrations (regional and local).

There is no uniform model in any of the countries analyzed of governmental responsibility for the subject. In general, urban cadastral responsibilities fall on municipalities different from those that exercise responsibility for the rustic cadastre.

In some countries, legal registry responsibility resides with the same department that has the Rustic Cadastre assigned; in others, it resides in different departments, but with a mandate to coordinate, they are in many times located in the same offices. One could compile a long list of ministries in the various countries that have cadastral or registry authority, either alone or in coordination with others. Additionally, in some of them, ex-nuovo organisations with ministry rank have been created, many times with independent structures that in some places act as coordinating staff of the various responsible departments.

The general impression is that the process of administrative structuralisation of the cadastre and the registry has not finished in the majority of the countries investigated.

Execution
Latin American countries
Although considerable differences exist in the degree of execution of the cadastre in all Latin-American countries, in general the degree of introduction is low, with many countries where there is an acceptable level of medium-scale information about rural land and scarce information about urban areas outside the main population centres.
In some cases, for example Chile, there is good cadastral information coverage, but its scope is limited and it lacks a cartographic base. The most generalized model is one of limited coverage insufficient for rural cadastres coexisting with some municipal cadastres implanted generally in the more important municipalities. And even in these cases there is frequently a disconnection between the cadastral and reality, given the intensity and speed of urban growth.

**Eastern and Central European countries**

The differences between countries in the degree of implementation of the respective models are notable. Generally, the greatest degree of execution is in the Central-European group, their size (physical and population) being a factor that has favoured this situation. In the East (Russia, The Ukraine, Belarús, etc.) several pilot projects have been executed, as an initial step towards the definition of a model adapted to each particular country.

In any case, the large financial resources required for creating a cadastral and carrying out the topographic surveying, or bringing an old cadastral up to date and modernizing it, make the implementation of a cadastral system more difficult still.

**Financing**

**Latin American countries**

One of the recurring themes nowadays is the enormous amount of resources necessary compared to what these countries can afford. It is thus quite normal to find international financing in the majority of the efforts to implement and modernize cadastres in these countries. Generally, cadastral financing is never planned to be self-sufficient. Rather, it is taken for granted that it should be financed by public funds. Not even in those cases in which cadastral information generates significant financial benefits does planning call for its own financing. Although this subject has recently been discussed in some countries.

**Eastern and Central European countries**

A similar situation exists in these countries with regard to financial resources. There are hopes that international institutions will foot the bill, and the European Union and the World Bank are already helping to fund pilot or partial projects.

Some ideas are being put forward that a small degree of self-financing could be possible. Although people do not seem yet to take it altogether seriously, such an option could be applied at least to title registration.

Property taxes could be used to produce sufficient income. This idea is mainly oriented toward rustic property, as in urban zones such taxes are not seen as major sources of income, unlike in the rest of Europe. In part this could be due to the primacy of the Rustic Cadastre, as indicated above.

**Summary and conclusions**

**Latin American countries**

- General agreement exists between those responsible for cadastres that a modern, multi-purpose cadastral is needed. In most cases, this conviction has not led to a sufficiently strong commitment to set in motion the necessary legislative, institutional, and financial drive. Consequently, there are few clearly defined projects for cadastral modernization.
- The urban explosion and the changes in land ownership over the last few decades have generated a demand for real estate title identification that overwhelms existing registry systems.
- At present, the fiscal objective is most important, but there is also majority recognition that the cadastral role as a source of information for urban planning and natural resource planning, as well as the importance of sufficient co-ordination with real estate public registries does not merit their integration.
- The degree of cadastral execution is generally very low and is found mostly in larger municipalities where the importance of fiscal resources generated clearly justifies the effort. This major effort by municipalities is causing the State to shed its cadastral responsibilities and making fiscal income become the most essential element.
- In general the institutional panorama in Latin-America is very disheartening in regard to cadastres. Crossovers and duplication of responsibilities occur only too frequently.

**Eastern and Central European countries**

- Unanimity prevails in considering the cadastral as an indispensable instrument for country modernization, development of a market economy. It is also seen as a basis for developing the land registry, with which there should be agreement, integration, or co-ordination.
- Cadastres must have objectives that initially prioritize the aspects that will help sustain land privatization (rural zones), distribution, and/or restitution.
- Initially, there is little emphasis on the urban cadastral system and on the potential earnings to be derived from land taxes.
- With fewer exceptions, there are difficulties in defining an operational model which can serve as a skeleton or backbone for a unique, specialized organization.
- There are problems with defining organic responsibilities and a diversification of responsibilities between various departments, organizations, institutions and corporations as well as between different administration levels.
- Financial difficulties abound for creating or constructing a cadastral system. Amateur efforts at creating pilot projects. Dependence on exterior financing.
- There is a very strong (excessive?) emphasis on the use of new digital cartography as the factor conditioning the creation of the cadastral, as well as on technical aspects and technology tied to topographic and cartographic disciplines as well as to information technologies, so it can lead to situations of paralysis of some projects (see chart on pag 20).

**Similarities and differences between blocks**

**Differences**

- Differing prioritized objectives, some assigned to economic reform, others oriented toward the modernization of local systems.
- Less emphasis in Latin-American countries on the co-ordination or integration between land registries and cadastres. Also on the technical requirements of a topographic cartography base of the cadastral.
- Greater possibilities in Eastern European countries of obtaining integration co-ordination between the registries and the cadastral, since they find themselves in an initial phase of administrative structure creation. On the contrary, in the Latin-American countries the land registry institutions are already consolidated, even though scarce co-ordination occurs with the cadastral institution.
- Incipient formulas for self-financing are being tried out in some Latin-American countries.
- A clear orientation in the Latin-American countries toward the urban cadastral and in the application of ordinary figures that the urban as well as rustic properties. In general, orientation of fiscal collection toward distribution of resources to the municipalities.

**Similarities**

- Consideration of the cadastral as an instrument for modernization for the country, underscoring its multi-purpose concept and its application to territorial planning, environment, etc.
- Different treatment given to the rustic cadastral and the urban cadastral.
- Habitual use in the reform of agriculture structures.
- Difficulties in financing cadastral projects. Poorly consolidated planning with respect to formulas for self-financing.
- Diversity of jurisdictional responsibility between the various ministerial departments as well as different administration levels.
- Political weight of larger municipalities, with the resulting tendency to unilaterally assume cadastral responsibility. Difficulty in strengthening a standardized, coherent cadastral information system and of proposing investments in global projects at country level.

**Final conclusions**

1. The cadastral is an indispensable instrument for any country, with the capability of meeting diverse objectives.
2. Centralization of jurisdictional responsibility and self-organizational administrative structure capable of managing both the rustic cadastral as well as the urban, are determining factors in order to generate and maintain a cadastral system with national coverage, as well as for investment efficiency.
3. Legislative development and political agreement should guarantee point two above.
4. The participation and co-operation of local governments is indispensable for the functioning of the system, especially in reference to the urban cadastral.
5. The application of a real estate tax supported by the cadastral should be looked at within the context of tax policies in each country, as a formula for self-financing.
6. The cadastral system should support the land registry system. Both should be coordinated in those cases where they are different institutions and when, for whatever reasons, they are generated at different times.
Financial Restructuring and Economic Development Program of the Argentine Provinces

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What is the Cadastre?

The Cadastre is a public registry in which information relating to real estate is recorded, organized, and publicized. Through it we learn about the land that makes up the province - its location, its makeup, its ownership, its value.

Cadastre information provides the essential element for knowledge of the urban and rural systems, because the Cadastre has its zone of action in the basic territorial unit known as the land parcel. Aspects related to its physical, legal, and economic condition are collected, organized, and registered.

What do we know with the Cadastre?

The surveying, organizing, and registering of information concerning the land parcel allows us to know about it in all its intrinsic attributes: form, dimensions, location, boundaries, titleholders; its recording in the Land Registry; if it is vacant or has construction; use of cultivated, type of cultivation, surface and production applicability, if water rights exist (irrigation); if it has a measurement and/or construction plan, and its location within the Redistribution Department files; its appraisal, separated by land and improvements (construction, crops).

After it has been surveyed we know about its extrinsic attributes: services it has (water, electricity, gas, sewers, telephone); communications (principal and secondary streets, avenues, routes); if it is asphalted; its location in relation to educational, security and surveillance, and health facilities; parks and sports complexes; if located in residential, commercial, or industrial zones, or whether it is part of the rural scene.

After we know the attributes, we can better define the land parcel and its contents in all its surroundings. Who prepares the Cadastre?

It is prepared by the Cadastre Directorate, a government entity belonging to the Executive Department.

What Jurisdictional Responsibility does the Cadastre Directorate have?

Among others, the following are important:
- Determine the correct real estate location, limits, dimensions, surface area, and boundaries, with reference to legal titles or possession.
- Establish the real estate parcel status and regulate its development.
- Have knowledge of territorial land resources and their distribution.
- Prepare economic and statistical data bases for tax legislation and planning actions by national and local governments.

What conditions have made possible the formation of a modern Cadastre?

In order for our country to have a Cadastre in each province in accordance with social desires and competitive needs in an international market, it has been necessary to take account of the following factors:
- The necessity for putting into practice social policies in housing, health, education, safety and security, the environment, and urban affairs. This requires exact knowledge of public and private real estate and allows for adequate planning.
- The political will to transform provincial tax systems in order to meet the need for increased tax neutrality in regional economies and a greater equality in sharing the tax load. A Cadastre would help tremendously by means of the exact valuation of real estate.
- The availability of computer technology that will allow the creation of a complete and up to date, efficient and reliable registry, of the size required by the Cadastre.

Why is it necessary to have a Cadastre?

The Cadastre indicates physical, legal and economic real estate data; its quality, age, location, owners, use, etc. Additionally, the Cadastre assigns a value to each property, known as the Tax survey. Such valuable information can serve multiple purposes.

The Cadastre is an essential information system, along with its computer support, that should be utilized by the Public Administration as well as by private citizens.

Cadastre information serves as a fountain of knowledge and valuation of real estate resources. It also serves as a means to prove the legal condition for the real estate owner and as a base for the determination of equitable and efficient taxation.

Presently the Cadastre institutions are experiencing great advances in their ability to fix the value of real estate, for which they were initially created. They are also being used in other functions related to development, which converts them into a multi-purpose instrument, thanks to computer technology.

What functions does a Cadastre carry out?

The Cadastre carries out three basic functions:
- It is the physical, legal, and economic identification registry of all real estate in the provinces, and therefore in the country. It is decisive in the increase of safety and security in real estate transactions due to the data credibility of its files.
- The Cadastre is the essential data bank for the creation of the various economic and social policies. The decision making process in Public Administrations and in the private sector in modern countries makes necessary data banks and elements that guarantee the success of the decisions taken.
- It is an indispensable support for the tax system, because the Cadastral value is the objective, constant element that serves as the base for calculating taxes. The growing demands of our society require public institutions the creation of just and objective processes for obtaining the necessary resources, a proportional distribution, and equitable fiscal obligations.

What is the document base of the Cadastre?

Obtaining land information and its subsequent registration generates a useful product for other State organizations and for the community in general.

Basic geo-referenced cartography

Cadastre cartography is made up of maps of different sectors in diverse scales that provide a joint vision about a particular territorial zone, and a large number of individual real estate measurement maps.

Basic geo-referenced cartography permits access to cartography by subject, i.e. services, communications, networks, surface, environment, safety and security, health, education, etc. and with public works and private works projects.

Alpha-numeric data bases

Alpha-numeric data bases provide legal information for each land parcel (owner, holder, recording in the Property Register), economic information for each land parcel (survey, crop), and physical information for each land parcel (surface area according to measurements, constructed surface, categories).

This data base is used in determining land values, sector qualities in specific zones, parcel values for the study of economic resistance to expropriations, in the determination of the base to be used for taxes, etc.

This data is conveniently processed in the corresponding computer taxes, which allows for extremely timely answers to consultations.
What is the possibility of optimising the use of this information?

The contribution of a geo-referenced cartography tied to a network of orthometric points with surveyed coordinates referenced to the national system, and an alpha-numeric database with all parcel attributes indicated in the administrative territory permits the creation of subject cartography developed by the Cadastre for use on behalf of the entities that serve the community. Some examples follow:

- Municipal Cadastre: With a data base related to municipal services, urban planning, infrastructure works, commerce, industry, land use, etc.
- Pipeline Cadastre: Includes water networks, sewers, gas, indicates trunk networks, secondary networks, regulating stations, etc.
- Irrigation Cadastre: Indicates those land parcels that have irrigation rights, including canals, their names, type of piping and surface, etc.
- Road Cadastre: Indicates main roads, designation of road categories (main, secondary), if asphalted, graded, etc., and their uses.
- Mining Cadastre: With location of properties, relating them to land titles where they are found, and determining the quality of minerals.

What are the possibilities for integration of this information?

A Territorial Information System (SIT) is the correct tool.

Once the Territorial Information System (SIT) is constructed, the reconnaissance of the territory is performed by integrating the information provided by the different entities that participate in its administration. The land parcel is the basic territorial unit. This element is provided by the Cadastre to the system. From it other attributes are added, including:

- Title (Property Registrar).
- Improvements (municipality).
- Public services: water, sewers (Sanitation works); electricity (energy company); gas (gas distributor); telephone (telephone company); etc.

This allows for, among other things, the creation and superimposition of subject maps from the information provided.

How is the Tax Appraisal determined?

Generally, the value of the land parcels is determined by adding up the value of the land before improvements, corrected by coefficients (for example, of forms in urban land parcels and of soil or rural land parcels), plus the value of improvements, affected by coefficients that take into account age and conservation state of the improvements, among other things.

Zones with standardised values are determined by taking into account town characteristics, service infrastructure, location within the territory, and other things.

The value of the land parcel, as determined by the Cadastre, is taken up by the General Directorate for Income, applies rates established in the Annual Tax Office Law, and thereby obtains the real estate tax.

Is the Tax Appraisal or the Cadastral Value a Tax?

The Cadastral Value of a land parcel is an universal, objective system of valuation of the real estate resources in a province and eventually of the country. It is an universal system because it is applied to all land parcels that are part of it. It is objective because it is applied by means of a normalized, uniform procedure for them all.

The Cadastral Value has tributary effects in many taxes, as it can be a base, but it should never be considered a tax.

Does the Cadastral Value have non-tributary effects?

The Cadastral Value is considered, for example, in expropriation procedures in order to fix a fair price.

It is also used, in some cases, to fix the selling price of tax lands.

What benefits accrue as a result of updating the Cadastral Values?

Updating the Cadastral Values produces benefits for society in general and for private citizens in particular. For example:

- The possibility for governments to create infrastructure plans, urban plans, and development plans with a sound knowledge of the economic effects.
- The transparency of transactions in the economic sector helps maintain a real estate market that is less speculative.
- The fiscal benefit of a truly honest value for real estate allows the distribution of the tributary load proportional to its actual values.
- The possibility of allowing companies and private citizens in general a correct programming, application, and management of their real estate investments.

National Legislation

The creation of the Cadastres in the Republic of Argentina presents us with as much diversity as there are provinces that make it up. It is recognised that the territorial Cadastres in the country, in the federal capital and in some provinces, owe their origin to the need to rationalize and make more effective the land property tax. With this concept, the Cadastre was only a support tool for the tributary system.

The modern legislative antecedent goes back to 1952 when Law 14,159 was passed dealing with the National Cadastre that determines the execution of the cadastre of the territorial parcel cadastre throughout the legal jurisdiction in its two fundamental aspects, physical and legal. With this law, the provinces were invited to adhere to the National Cadastre regime if proper authority deemed it keeping in mind that the cadastral police powers are within the purview of the provinces, not delegated to the central government.

After this, every province began to update its cadastres by legislative actions and execution in accordance with its possibilities and territorial reality.

In 1973, with the coming into force of Law 17,711, (reformulating article 2302 of the civil code), that instituted the registry of acquisition or transfer of real estate rights, and Law 17,801: that spread the system of registration by royal form in each province, and Law 24,480 was passed. This law specifies that territorial cadastres in each province . . . will acquire, register, and order information relative to real estate in each territory.

The objective of cadastres, according to the law is to:

- Determine the correct location, limits, dimensions, surface area, and boundaries of real estate, with reference to legal titles, or harm.
- Establish the parcel state of real estate and regulate its development.
- Go to know the land resources and their distribution.
- Create economic and statistical data bases for tax legislation and planning by national and local governments.

Situation of the provincial cadastres

A survey done at a national level whose objective was to get to know the cadastral reality in the Republic of Argentina as well as of the concepts used in the modernization projects of some provincial cadastres indicates that in all provinces there has been important parcel growth, administrated by the various provincial Cadastre Directories, with the same structural functions of twenty years ago, with the exception of computer support.

Fiscal management

Real estate taxes represent approximately 1.2% of fiscal earnings in the provinces.

The majority is dependent on the communities for improvement information.

One finds in all provinces tributary and non-tributary income that depend of Cadastre information, such as municipal fees, stamp tax, transfer tax, expropriation, fiscal sale of land parcels, etc.

Cadastral information deteriorates as a result of outdated valuation methods.

Physical management

All provinces have identification at the land parcel level, and they all have Cadastral zoning tied to provincial laws.

All have cartography that is incomplete, out of date, and manually operated, in spite of having authority to manufacture it up to 1:50,000.

Functional-organic management

In the majority of the provincial Cadastre Directories, one can see a deterioration in its organic structure, in operational management, and it is out of date functions.

Infrastructure

In various provinces one can see the deterioration and obsolescence of the automobile fleet and insufficient office space.

Computerization

In general, a technical deficit in computer support can be detected, as well as an incipient and inadequate computer equipment inventory and incomplete data bases and electronic processes.

Some concrete situations

In general one can see pressure in land parcel administration common to most provinces.

Some concrete examples are:

- Land distribution has not had the support necessary for the success of the functions imparted by law, which has made it out of date, in spite of the efforts of the personnel involved.
Lack of resources has impaired the permanent, total updating of the Cadastre, which has resulted in lost efficiency and safety/security. Misuses

In spite of the clear absence of support by decision making political organizations, the technicians involved with the distribution have the aptitude to maintain the integrity of the Cadastre.

The Cadastre and Geodesy Directorate have developed their activities in the framework of extremely lean budgets while accomplishing their missions and functions. 

As for work experience, the institution has demonstrated its capability to design the principles of a territorial information system. 

Chaco Fiscal appraisals are out of date and housing categorization is deficient.

The last Real Estate General Evaluation (1987) of all real estate in the province for tax purposes, the values of this massive revaluation, became outdated in spite of a 1992 to date coefficients. Formosa

There is a lack of equity in the valuation of urban, sub-rural and rural land parcels and their improvements. 

The general revolution was done ten (10) years ago and its updating was massive due to inflation and hyperinflation of past years. Observing neighboring properties one finds uniform indications of injustice in the application of the valuation. 

The last definition of basic unitary values dates from 1982, and in a date one can say in general terms that the real estate valuation is very out of date. 

Tucuman With respect to valuation of improvements, there is a disconnect found between the categorization and its determination methodology and reality in the province. 

Neuquen The declarations by taxpayers and after studying the results of direct inspections undertaken, discrepancies surface in regard to the categorization, age, and status of the constructions, generally to the detriment of municipal and provincial governments. 

Entre Rios As a result of the analysis undertaken, variables were identified that indicate where and how the differences came about that cause institutional problems. For example, the application of evaluation methodologies that do not meet current criteria and that provoke a lack of preparedness on the part of functionaries, are some specific factors that allow the Cadastre Registry to become out of date. 

La Rioja The updated information in the graphic registers and the alpha-numeric base should be pointed out. This happens because the methodology used for the division of land does not bring the alpha-numeric base up to date with the new parcel status if no inspection has been carried out. The objective is the categorization of the real estate and it is being held back by lack of resources. 

La Rioja Modifications to the status of the land parcels is not communicated to the Cadastre. 

In the case of improvements there are defects in the collection and evaluation, because of deficiencies and lack of communication between some municipal and provincial entities and the Cadastre—refusal of some to assume professional costs—as well as the existence of a custom or tradition of including municipal control and accompanying taxes. 

Formosa Lack of information transfer between the two municipalities and between them and the province impedes reaching optimum predictions, making decisions. 

Tucuman Cadastre information management is not uniform between province and municipalities, nor between municipalities. 

Entre Rios The percentage of real estate tax collected is relatively low. Nevertheless, the levels of evasion are very high (it is estimated at 60% for Villa Central). 

Catamarca The relationship collected/billed. Income Directorate spokesmen estimate to be approximately 45%.

San Luis With respect to the General Income Directorate, present collections are around 40%. 

San Juan The present objective consists of surveying 17,850 land parcels that presently do not pay taxes, and their incorporation into the Cadastre Registrars, and 14,067 homes into the real estate base. 

Tucuman Construction of houses by the Provincial Housing Institute is one of the reasons the Cadastre is out of date, affecting parcel registration. 

Entre Rios There are more than 20,000 parcels, the majority build-up, that for different reasons do not pay taxes due to official housing plans with diverse problems that impede their incorporation into the real estate tax base. 

La Rioja In the case of unimprovements there are defects in the drafting of plans is done manually. It lacks a control, analysis, and evaluation system. This results in an untrustworthy real estate registry and a large percentage of tax evasion due to non-declared construction, omitted improvements, new expansions and out of date construction qualities. 

Santiago de Estero An outdated Cadastre affects the safety and security of the real estate business.

The eastern, central, and southern zone, mainly along national route 14 to the Brazilian border, is where properties predominating that are located on local lands without ownership registration. 

Misiones As for rural parcels in the northern and western zone of the province, there is an important defect in geographic individualization, as 100,000 of them lack known planimetric positions in the pages of the graphic registry. 

Catamarca The nation, prior to the provincialization of the Chaco and, after 1972 the province, have registered only half the rural land. 

Chaco Additionally, the owners or property holders' addresses, who are responsible for paying real estate taxes, are out of date due to omission and/or errors in the Cadastre Registrars. 

Catamarca As for the owners, holders, adjudicators, and/or those responsible for each parcel, many of them are unknown. 

Tucuman Socio-economic indicators signal changes in what happens to the population, housing, land use, etc.; but are not collected in the physical, legal, and economic information administered by the Real Estate Directorate.

Jujuy Solutions offered by the provinces. 

In the Republic of Argentina there is a dire necessity for updating Cadastres adapted to the new concepts of land information handling, and prepared to respond to the requirements that modern society must face for its development. 

The Ministry of the Interior, through the Secretaria de Asistencia para la Reforma Económica Provincial (Secretariat for Provincial Economic Reform Assistance) provides incentives for the execution and updating of provincial Cadastres. The solution to Cadastre problems is answered in most provinces by an update of the Parcel Cadastre under the Financial Restructuring and Economic Development Program for the Argentine Provinces, financed by the World Bank and the International Development Bank (IDB) (see pp. 28-29) 

In general, the solutions to these problems are found by doing the following.

Codification of Records. 

Aerial and satellite images. 

Goniometric and topographic assistance. 

Geodesic and topographic assistance. 

Land parcel census.
Conclusion

The incorporation of computers in Cadastre management, of geodesy by satellite of satellite imagery, and the electronic progresses in the design of measurement instruments and cartography processing have changed the old filing system which was the Cadastre into a dynamic data bank that reflects territorial reality with ordered, trustworthy information about:

- The identification and localization of all real estate.
- The dimensions, surface areas and boundaries, and their graphic representation.
- The name of the owner or landholder.
- Its characteristics, advantages, use, crops.
- Its economic valuation, created from an exact data base using modern evaluation techniques.

With this new structure, the Cadastre becomes an indispensable tool for the Public Administration. It provides essential information to establish realistic economic and social policies.

It constitutes a backup to the interests of the private citizen by guaranteeing legal safety and security of real estate transactions and permits the creation of investment strategies supported by reliable data.

Annual increase in the collection of real estate taxes

The quantifiable monetary results that execution of these projects would reach are detailed in the following chart. Additional revenues are from the increase in the real estate tax base as a result of the incorporation of new construction and undeclared expansions, of unregistered land parcels, and of the updating of urban and rural land values (see chart on page 30).

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**Cadastre and Land Registration Systems of the Republic of Belarus: State of Art**

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**REPUBLIC OF BELARUS**

The Republic of Belarus is situated in Eastern Europe. The area of Belarus is 207,600 sq. km, population is 10.3 millions of people. Belarus has adjacent boundaries with Russia, Ukraine, Lithuania, Latvia and Poland. Belarus was part of the USSR until 1991.

In 1991-1993 Supreme Council of Belarus adopted land reform laws: (a) About property, (b) About Land property, (c) About privatization of State property, (d) About privatizing of housing, (e) About pledges and others.

At the end of 1993 there were already 50 millions of people. By the end of 1995 the number of people was reduced to 10,3 millions of people. Belarus has adjacent boundaries with Russia, Ukraine, Lithuania, Latvia and Poland. Belarus was part of the USSR until 1991.

Protection of Republic Belarus and Ministry of Housing and Communal Services are responsible for development of the methodology and regulations of immovable property registration. To all land, there are two separate systems of registration of immovable property in Belarus. The first one is registration of land and rights on land. The second one is registration of all others uses of immovable property and rights on them.

Ministry of Natural Resources and Environmental Protection of Republic Belarus is responsible for the Land system. Ministry for Housing and Communal Services for the second one. There is no separate organization for recording data about boundaries and parcels in separate registers. This work is done by departments of region Executive Committees (Local Government). Recording data about legal rights on object attached to the land are accomplished by Republic Center for Registration of Immovable Property of Belarus and local Bureau for Registration and Technical Inventory. The main tasks of the Centre are to created national network for registration of immovable property and rights on immovable property, national data base, new legislation, education, staff of the system and so on.

There is not any laws on cadastre and registration systems. The Law «About registration of rights on immovable properties» was developed only in 1995 with the assistance of World Bank, Mr. S. Butler from USA, Mr. V. Husser from German, Mr. S. Butler from USA, Mr. S. Butler from USA, Mr. S. Butler from USA, Mr. S. Butler from USA, Mr. S. Butler from USA.

There is not any laws on cadastre and registration. There is not any laws on cadastre and registration. There is not any laws on cadastre and registration. There is not any laws on cadastre and registration. There is not any laws on cadastre and registration.

By this Law integrated systems for registration of land and attached object will be created, general and fined boundaries, sporadic and systematic adjudication are proposed. System of rights registration is supported by cadastre and local Bureau for Registration and Technical Inventory. The registration of rights on several types of unit of immovable property is proposed, namely:

(a) a land parcel;
(b) a land parcel and the objects attached to it which together are held in unified ownership;
(c) an object attached to a land parcel, which is in the ownership of someone other than the owner of the land;
(d) an object on non registry land;
(e) portions of buildings or structures which under law may be separately owned;

Pilot project of the system is developed in Minsk city, capital of Belarus, and in several other Belarus cities. With such pilot projects the main problem is the fact that the new system must not to be in contradicition with old legislation that is active in country. Pilot project have a client/server architecture, AN—data base and GIS to generate registry map and to compile records for new Registry Book.
The Cadastre and the treasury in Colombia

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What is the Cadastre?

The Cadastre is defined in Colombia as: An updated, classified inventory or census of real estate belonging to the State and to private citizens, used for correctly identifying this real estate physically, legally, economically and fiscal.

The physical aspect is understood to mean graphical identification of the land and building boundaries or identification by aerial photographs (orthophotography), and a description of the land and buildings. The legal aspect consists of noting on cadastral documents the relationship between the active subject in law, that is, the property owner or property holder and the object or property, by the documentary identification or taxpayer identification of the property owner or property holder and the local registry or real estate license of the property.

The fiscal aspect consists of the preparation and delivery of appraisals to the respective municipal treasuries and the National Tax Administration. These cadastral appraisals are the basis of the rate corresponding to the unified property tax and other taxes is applied in accordance with prevailing legal provisions.

The economic aspect consists of the determination of the property cadastral appraisal. It is necessary to clarify that Law 14 of 1983, the latest bill modifying cadastral regulations, establishes in article 4 that for the constitution and conservation of the Cadastre, the appraised value for each property is determined by adding cadastral appraisals (done independently) for the land and for the buildings. This way, permanent or semi-permanent crops and designated real estate are eliminated from the cadastral appraisal.

The Cadastre in Colombia has traditionally been oriented toward legal and fiscal objectives and today its multipurpose character and its importance for territorial re-ordering is widely recognized. A good Cadastre is an instrument of great utility for economic and urban planning and for designing housing and agrarian reform policies.

The real estate property census has aerial photographs and maps that contain information on agroclimatic, topographic and weather conditions, capacity and limitations on the uses and exploitation of the land, and its possible economic uses. Subject maps indicate the existence of any running water, roads, public services and land use. The property file, in addition to information on the property owners or property holders and the method of acquisition of the property, also contains a description of the buildings or constructions, with the following details: information on the status, quality and materials of the structure, the main finishing materials, and bathrooms and kitchens; and general information such as the number of stories, businesses, garages and year of construction.

The great majority of data mentioned is already available as a computerized list of property attributes, which relates to the entire property inventory managed by the Institute. Cadastral data bases are thus considered privileged information for the various users, especially the municipalities, particularly when they create their development plans.

The Cadastre makes it possible to know the production potential, the prevailing business of a municipality. That is, it is possible to discover the role or mission of the urban and the rural areas, within the region and the country. It also makes a large part of the information necessary available for creating development plans.

Cadastral projects


Cadastral constitution
This is the process for obtaining information on property of an organic cadastral unit or part of one, taking as a base its physical, legal, tax and economic aspects, in order to accomplish the Cadastre's general objectives.

Conservation
This process is that maintains cadastral documents updated as changes occur to the real estate, transfers the inter-connection between National offices, the Registry and the Cadastre.

Upgrading the Cadastre
This consists of the various operations for updating cadastral data, by revising physical and legal elements of the Cadastre and eliminating (in the economic elements) disparities originated by physical changes, variations of use or productivity, public works or local conditions of the real estate market.

Today, the Institute handles the Cadastre of 942 municipalities, i.e. approximately 98% of all municipalities. It has consecrated and put into practice, according to criteria established by Law 14 of 1983, 6,486,212 properties in 911 municipalities, and updated 3,473,729 of these properties, whose appraised value as of the first of January was 43,100,000 million pesos.

In 1996, it is expected that 25,397 properties in 24 municipalities will be constituted, and 9,063,939 properties in 137 municipalities will be updated. As this rate, by the end of the year there will be approximately 6,511,000 properties constituted in accordance with regulations of Law 14, 1983, and thus 99% of the properties and 99% of the municipalities that the Agustín Codazzi Geographic Institute is in charge of will be constituted.

The impact of the Cadastre within the framework of Law 14 of 1983, in relation to cadastral appraisals, can be analyzed comparing the current situation with that of thirteen years ago. In January 1982, 3,981,345 properties were incorporated and their appraised value reached 612,905 million pesos. Data on the first of January 1996, shows 6,683,612 properties incorporated with an appraised value of 43,478,300 million pesos. 2,702,067 properties have been added to the cadastral registers and the appraisals, in constant pesos, base year 1982, have gone from 612,905 million pesos to 2,447,417 million pesos, a four-fold increase. The efforts of the Agustín Codazzi Geographic Institute, with the economic support of the National Government, during the last five years have led to a substantial increase in constituting and updating, as well as in modifying the appraisals of 6,165,950 properties.

700,000 changes to the property registers are expected within the conservation program for 1996. These changes are related to sales, unifications, divisions and new construction.

Other projects
This year the Cadastre Sub-Division has planned the following projects:

- Establishment of the Cadastre Geographic Information System (CGIS).

The Institute has created a digital map with a scale of 1:2,000 for 15 cities in Colombia, and digitization of cadastral graphic information (lot boundaries, constructed area boundaries, etc.) is being completed. We hope to digitize 600,000 properties by the end of the first trimester this year and, if resources permit, digitize 500,000 more properties by the end of the year. The CGIS data model has already been validated with very good results.

Within this activity, the program of Cadastre support to municipalities is being promoted to zone the territory. The inventory of territorial requirements is already being created. The exact geographic information systems and the technical parameters required for compatibility with other systems in the Geographic Institute are being determined.

A committee has been created whose main function is the standardization of cadastral digital data. Thus an excellent tool will be created for Colombian municipalities, and information will be customized to users' requirements. These activities form part of the Technology Modernization Program being carried out by the Institute in all areas.

- Large-scale Title Claims

The Colombian government established a large-scale title claim plan for those properties where equa-
Cadastral authorities

The Cadastre in Colombia is carried out by the following authorities:

1. The Agustín Cadazzi Geographic Institute (GAIG) (Instituto Geográfico Agustín Cadaz), which handles 90% of municipal Cadastres. The Administrative Department for District Cadastres (ADDC) (Departamento Administrativo de Catastro Distrital), in charge of the one in Santa Fe de Bogotá, the Departmental Cadastre in Anzoátegui and the Municipal Cadastres in Cali and Medellín.

2. The GIAC (Gestión Integral de la Cadastre) reports to the Ministry of Finance and Public Credit. The Executive Committee has representatives from the Ministry of the Treasury, from the National Department of Planning, from the Ministry of the Environment, from the towns halls and from the governors' offices. The ADDC is a decentralized agency of the Capital District and the others belong to the Departments' Treasury and Municipalities Secretariats.

According to Law 14 of 1983, cadastral work should be tied throughout the country to technical standards established by the GIAC. The GIAC is responsible for overseeing this and advising the rest of the cadastral agencies.

The GIAC carries out the Cadastre under its jurisdiction through the Cadastre Sub-Directorate. It has 7 regional offices, 21 section offices and 45 Cadastre representative offices within the national territory. Each of these agencies has its cadastral inventories of real estate properties (original photographs, maps, cadastral maps, ownership files, subject maps, computerized archives of cadastral archives) and, in the case of the Instituto, the section offices have the computerized archives of attributes handled by its representative offices and in turn the Cadastre Sub-Directorate has the national archives.

The Public Instruments Registry is a State service and is directed by the Superintendency for Notaries and Registry, part of the Ministry of Justice. It has 210 offices in the country. They are in charge of keeping the pages of real estate matriculation and notifying changes in real estate ownership to the Cadastre offices.

The exchange of information using computers is being studied today and automatic downloading is already being talked about. Coordination between authorities is done through GIAC, that has a seat on the Directorate Council of the Superintendency for Notaries and Registry.

Land administration

Colombian municipalities are responsible for promoting, as part of their autonomy, the ordering of their territory, the equitable and rational use of land and carrying out efficient urbanistic actions. They are also responsible for the creation and protection of urban public spaces as well as environmental protection. In the majority of the larger municipalities there are agencies charged with land administration for the different spatial objectives such as: housing, recreation areas, sports parks, environmental protection and land uses.

In rural areas, the administration of uncultivated territory is a function belonging to the Colombian Institute for Agrarian Reform, National parks and reserves are administered by the Environment Ministry. The Interior Ministry is charged with handling native reservations and establishing general policy for the administration of Negro communities. The Cadastre is charged with doing the land inventory and all State agencies supply it the pertinent information.

Cadastral valuation

Cadastral authorities have two main areas within their organizational structure: Constitution and Updating, and Cadastre Conservation. Additionally they have support offices such as: Legal Office, Systems, Finance and Administrative.

Cadastral Constitution and Updating

The first area dealing with Cadastral Constitution and Updating, is for promoting all the procedures and studies for complying with standards established for these activities, to wit: 1) verification of municipal boundaries, urban limits and general urbanism; 2) property identification; 3) property location and numberation in the cadastral map; 4) diligence concerning the property file; 5) determination of physically homogeneous areas and the study of the real estate market to determine land and building values; and 6) settlement of cadastral appraisals.

Cadastral Conservation

The other area, Conservation, is for maintaining all cadastral documents up to date, and attending to requests for revision of appraisals, registration of changes, admission or refusal of voluntary appraisals, motions to set aside judgments and appeals against court orders. Additionally, it is required to conduct the annual readjustments requested by the National Government, for all properties. As can be seen, this is the agency charged with maintaining the cadastral inventory.

These two agencies belong to the Director, Cadastre Sectional Office or Municipal Office.

Valuation of urban and rural real estate

Law 14 of 1983, establishes that, for cadastral objectives, the appraisal of each property is determined by adding the partial appraisals done independently for the land to the one done for the buildings. The cadastral appraisal determines the value of the properties, obtained by research and analysis of the real estate market, and should be done for homogeneous areas, where unity values are determined for land and buildings that, multiplied by the respective values, yields the appraisal (see pag 37).

The appraisal is based on field and office observations, done in a brief period. Detailed investigations are done of a reduced sample of properties to be appraised. The normal mean price is looked for of the lands and buildings.

The classification of land for the determination of physically homogeneous rural areas is obtained based on agrological, topographical and weather conditions of the land and its capacity and limitations of use and handling. For urban areas, topographical conditions are utilized based on the economic use as well as future use, public services and roadways.

Subject maps resulting from this process are: for urban areas - classification of the constructions (housing stratification), land use and municipal regulations, public services, roadway status, topography, physically homogeneous areas and geo-economic areas. For rural areas - areas of land similarity, land use, lines of communication, running water, municipal regulations, and geo-economic areas on physically similar land. Subject maps are also being created of public services (telephone, energy and water mains).

For building appraisals, the quality of construction and construction materials are taken into account, as are wall coverings, floors, bathrooms and kitchens. For industrial buildings, lights and height.

Determination of unitary prices

To appraise constructions, we have come to the conclusion that each type has its own market, with proper tendencies and behavior, framed within the dynamic of each city. Therefore the selection of the appraisal samples and the real estate market research is done and processed independently.

The indicators and inputs are the same as those utilized for establishing land values.

Statistical processes and regression analysis determine the curve equations that relate the unitary price.
with the referred scores. Constructions that have scores higher than their unitary appraisals, that is, similar characteristics and the same location, have the same appraisals.

By this process the equations are established for the different adjustment curves (potential, exponential, straight, logarithmic, etc.) and keeping in mind the statistics such as standard deviation, determination and typical error coefficients of the estimate, the curve that best explains the appraisals is selected. The unitary price of the different types of buildings for all the scores found is thus determined. This process, the same as the others, is supervised and controlled by functionalities of the central part of the regional part and of the sections of the Institute.

Finally, in order to determine the appraised value of the construction, one simply multiplies the unitary value, keeping its score in mind, by the area.

Obviously, using multiple regressions one can select other variables such as the age, area of construction, etc., in order to improve the statistics.

Fiscal aspect

Unified Property Tax

Law 14 of 1983, assigned the function of fixing property taxes to municipal councils. General parameters were established, such as to be differential, keeping in mind the economic objective of the property, low-income housing and small rural properties, for agriculture production, should be charged the lowest rates.

Afterwards, Law 44 of 1990, united four taxes into one, called “the unified property tax”. These taxes were, the property tax, the restitutions and public tax, the socio-economic restitution tax and the cadastral surcharge, focused towards the nation.

It modified the rate brackets (between 1 and 16%, and up to 33% for less). The base subject to tax is the cadastral appraisal and it is the responsibility of the cadastral authorities for establishing it. This tax is charged and collected by municipalities and is part of its own resources (see pág. 39).

Environmental Levy

Law 99 of 1983, established an environmental levy or environmental surcharge on real estate ownership, for environmental protection and for renewable natural resources. This tax is collected by the municipality and is transferred to the Regional Autonomous Corporations, which in turn use it for programmes and projects for protection and restoration of the environment and renewable resources.

Preumed Income

The State presumes that the cash income of taxpayers is not lower than 5% of their bank balances or 1.5% of their gross net worth. The first 100 million pesos of the value of the taxpayers’ houses and the first 150 million of assets for the agricultural sector are excluded from the base used to calculate this presumed income. This tax is collected by the nation. Minimum figures to establish net worth are the cadastral values.

Multi-purpose applications of the Cadastre

Updating the cadastral inventory

The cadastral authorities are responsible for conserving Cadastres. As has already been said, this consists of keeping all documents up to date (aerial photographs, maps, property files, IT archives).

One of the main managers of conservation is the Registry of Public Instruments, which is obligated to inform the Cadastre of modifications of real estate property. Cadastral authorities thus can continue to update their registries. Another update source are the owners, who come to the Cadastre to obtain the necessary certificate in order to legalize before a Notary all transfers, constitutions or limitations of domain of their real estate (see pág. 39).

Users of cadastral information

The main users of cadastral information are (see pág. 40):

Use of cadastral information

The information collected by the Cadastre was established keeping in mind multiple objectives, especially for the municipalities. These use it to establish and update development plans, territorial ordering plans and socio-economic stratification of housing for public services and transfers. Cadastral agencies turn over and update the basic information for these objectives and the municipalities complement it for their own needs (telephone, energy, gas, water meters, sewers, etc.). With the creation of digital plans and the use of cadastral geographic information systems, municipalities can also keep watch over the creation and the protection of public space as well as the protection of the environment in a timely and efficient manner.

Conclusions

In this way the Cadastre is accomplishing the mission of producing, analyzing and divulging information in order to support planning and territorial ordering processes.

One of the strengths of the Agustin Codazzi Geographic Institute is in being able to count on four technical areas, Cartography, Agrology, Cadastre and Geography, under its care. It is one of the few agencies in the world with this structure.

The Cadastre is very important in inter-governmental relations because of its utility as a tool for planning government policy. It has been said that “When a country knows what it has, what it can count on, then can it begin to plan based on its capital”. When investment development policies begin to be based on approximated data and estimates on more expectations or speculation, a less solid support is generated that can lead to failure.

Reforms to introduce to the National Cadastre of Cuba for fiscal, economical and juridical goals

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Accurate knowledge of the country’s real estate information is an indispensable base from which to meet new requirements in the economic and administrative management of organizations within national territory. Changes in the economic and social order lead to the enrichment and transformation of the National Cadastre, the most comprehensive real estate information system at Cuba’s disposal.

The Hydrography and Geodesy Directorate and the business group GEOCUBA, jointly with the Ministry of Finance and Pricing as well as other agencies within the State Central Administration, have begun a project to determine the reforms that should be introduced to the National Cadastre, with a view to achieving a more universal operation that satisfies society’s needs today.

In response to a suggestion from Mario José Limbert Bosch, we decided to present a cadastral project to the “Workshop on Reforms of Cadastre and Land Registration Systems in Central and Eastern Europe and Latin America”, sponsored by the General Directorate of the Center of Cadastre Management and Cooperation of Taiwan, the Ministry of Economy and Finance and backed by the Committee for Human Settlements, of the United Nations European Economic Commission.

Overview of the National Cadastre of Cuba

The National Cadastre was completed in 1992 in 161 municipalities with rural areas. It constitutes the primary information system, where one can see graphically and in written form the country’s real estate and the people and corporations that use it (whether or not they have title or are in legitimate possession of it), in
order to obtain real knowledge of the national territory. It will serve as a guide for the objectives of economic and social development in all aspects necessary.

The National Cadastre was formulated on the basis of the Socialist countries' experiences. In fact, it was begun using the former Socialist Republic of Czechoslovakia as a model. This cadastre was considered one of the best and most advanced in the world, having been actively operating for over 300 years. It was inherited from the Austro-Hungarian empire, which continued the Latin cadastre system to this day.

Cadastral documentation is made up of graphic documents (maps) and written documents. The National Cadastre is represented mainly by maps with a scale of 1:5,000, for 93% of the national territory (rural) and on a scale of 1:25,000 in those areas where parcel density is very low (marshy areas), which account for the remaining 7%.

The Cadastre is an urban area was only created experimentally. It was disconnected due to the lack of resources, and was only completed in the municipality of Varadero and in various Popular Councils in Havana and other main cities in the country, covering only 1% of the urban surface area within the national territory. In the rural Cadastre nine types of areas are represented: one agriculture and eight non-agricultural. Agriculture zones include land dedicated to farming and activities directly tied to farming, as well as idle land. This type of area is classified by fourteen land-uses for sugar-cane, citrus fruits, coffee, cacao, fibers, rice, tobacco, cattle grazing, other and idle land. All of these land uses are assigned to the landholders according to land occupancy rules.

At present, the Hydrography and Geodesy Directorate, of the Revolutionary Armed Forces Ministry (MINFAR), is responsible for the direction and control of the National Cadastre, proposing the policies to follow in the country for development of this activity. The business group GEOCUBA is in charge of the execution of the Cadastre, which includes all measurements, research on the land, and cadastral cartography, done on the basis of tasks assigned to it yearly.

Cadastral data is updated interactively with the landholders, by experts located in these offices. They make it possible for anyone to obtain cadastral information. The Cadastre measures land parcels and properties in general, and therefore the information it provides is accurate and precise.

Information contained in the National Cadastre, whether in graphical or written format, is used in three fundamental ways: as the base for the Land Use Annual Balance, for the registration of cadastral certificates for registering property; and as the base for specialized registration for agricultural and forestry purposes that are requested by different entities; it is used in statistical information on land use and landholding in the production of the population and housing censuses, in concrete informational tasks for the government and studies for the betterment of the political-administrative division. Even if it lacks cadastral valuation, it is used in the physical planning of rural and urban areas. In spite of all the uses already mentioned, the universal use of the Cadastre is not yet a reality.

**National Cadastre reform project for fiscal, economic and legal reasons**

Maintaining adequate control of the country's real estate would allow better gathering and processing of the information required by agencies of the State Central Administration. This information is used for the proper dimension of its activities, such as tax collection and registering housing properties, among other activities, requiring continuity and continuous adjustment of the National Cadastre.

To analyze this subject, the Ministry of Finance and Pricing, and the Hydrography and Geodesy Directorate organized a working group that included the Ministries of Justice, Agriculture and Sugar, as well as the Cuban National Bank, the National Statistics Office, and the Institutes for Physical Planning and Housing, and the business group GEOCUBA, that came to the conclusion that it was necessary to involve the Cadastre immediately in the tasks detailed below.

**In the Tax System**

The Cadastre is of capital importance because of the information it can provide the tax system. One of the fundamental benefits that its introduction would bring, in rural as well as urban areas, is that it would offer indispensable data to guarantee tax system principles such as generality and impartiality of the tax burden, based on modern, easily accessible information.

Appropriate real estate registration helps in reducing tax evasion; additionally, it serves as a source of complementary information for taxes levied on the income of people and corporations, as well as taxes on property, especially concerning property taxes. The National Cadastre, after the necessary modifications to its structure and work technology, could offer all the data related to the base subject to tax, surface area measurements, exact geo-referencing and real estate property characteristics. In the mid-term, it would become the fundamental base for the valuation of property.

The Cadastre allows us to count on location data, measurements and other information for taxing real estate and other land boundaries, including all types of man-made works and molehills, to accurately define and tabulate property and make data bases for appraisals, as well as for State control of its goods and their utilization at territorial and national level.

**In the country's legal conversions**

The National Cadastre's value, from a legal viewpoint, allows us to know the real area of urban and rural real estate, its boundaries, linear and surface area measurements, check the data with the titles brought to the Property Registry dealing with real estate, verify the titles, and allow or deny their inscription by correcting the titles when a correctable fault is detected, such as correction of real estate areas.

Another aspect of the urban Cadastre to keep in mind is its importance as a notarial instrument, providing the necessary security of working with exact data concerning the area of real estate in international transactions, transfers, adjudications, divisions, and others.

In the case of non-came agriculture industry

The engineering system that constitutes the National Cadastre, used to benefit agriculture, allows its immediate conversion into the permanent official obligatory information base for the correct planning and transformation of agriculture; forecasting and control of farm yields; analysis of the economic potential in determining subsistence farming plans; feasibility studies of land exploitation with different crops of specific interest and establishment of the required crop rotations and stock of land with subject representation of the land factor and aptitude for different crops; planning and cultural treatment by areas such as the volume of fertilizers, the use of pesticides and fungicides, allowing the land to be used and rotation of the land, crops, planning and harvest.

**In support of banking**

The cadastral certificate can be used as an instrument of guarantee for requesting bank credits related to real estate. It can be used now in rural areas, and in urban areas once they acquire the Cadastre.

**Other general applications of the Cadastre**

Use of proven measurement and research techniques that help obtain maps and cadastral information of real estate properties along with large scale topographic mapping know for, in addition to the utility given the National Cadastre and other subjects mentioned previously, other applications of specific interest such as: defining geographic courses, national parks, urban and rural inhabited areas; land planning, locating and controlling social services; planning for community services (solid waste and sewage management, street paving, supplying drinking water, urban electrification); in ordering, using, protecting and sustaining development of forest and wildlife; in controlling the occupation, use and conservation of land, and detecting violations, in support of different aspects of environmental protection and the rational use of natural resources; in defining water surface areas and in support of regulations established for the protection of interior waters and coastal areas; and in the delineation of mining areas and evaluation of the effects caused by exploitation of these areas.

**Actions to be taken in updating the National Cadastre**

The objectives to be reached by the development of the National Cadastre are of vital, far-reaching importance for the State. This is why reforms are needed.

We are currently in a study and decision-making phase to upgrade the National Cadastre so that in the short-term it can be modified to today's needs. Our country's needs include real estate legal aspects, needs of the tax system and exact knowledge of property in
the national heritage. This is why the following are analyzed:

- The country’s cadastre development policy and an up-to-date maintenance, that foresees the formation, conservation and revision of the real estate Cadastre.
- The regulations and systems relative to the formation, conservation and revision of the real estate Cadastre.
- The regulations and systems relative to the formation, conservation and revision of the real estate Cadastre.
- The Cadastre in charge of the cadastre valuation process, which up to now have not been accomplished, and will be gradually implemented until they reflect the country’s riches.
- Information systems and computer means necessary in accordance with the complexity and multiple uses that the Cadastre will assume.
- The standardization of cadastral documentation, keeping in mind the different needs to which it will be used, and everything relative to publications, their content and currency.
- Cadastre socio-economic, administrative and inspection planning.
- The human, material and financial resources to be guaranteed for this activity.
- Personnel training required due to these new requirements and the determination of how much technical assistance will be given to the different offices that carry out the Cadastre.
- Developing the concept and function of cooperation procedures with agencies of the State Central Administration.

On the basis of this study, the general program for the introduction of fiscal, legal and economic ends to the National Cadastre will be created. It will outline the phases required to accomplish its modernization and thus achieve the diversity of applications forecasted. It will be necessary to adjust legal regulations as well as the standardized technical base that will direct its performance.

It is necessary to strengthen the activities in the Cadastre, municipal offices, providing the required personnel, means, and equipment on a priority basis. This must be accomplished in order to introduce the reforms step by step. As for the work force, the mid- and high-level technical staff, specialists in geodesy and cartography who currently work with the Cadastre, must be augmented with engineers, architects, and other professionals such as automation systems specialists, lawyers, and economists.

Our Cadastre is characterized by the high level of manual labor used, fundamentally during updating. Different ways must be found to achieve a modern, computerized Cadastre.

While the rustic Cadastre, finished throughout the country, contains reliable, updated data, once it assumes new tasks and is used more extensively it will require the massive use of computer technicians. This is a direction that requires special attention, and a plan for international co-operation, which will help to diminish the time of execution and increase the potential of information processing and exploitation. An information system must be established that includes the organization and operative structure that works on the Cadastre.

It is evident that the re-organization of the country’s Cadastre will lead to adjustments in direction and production, as well as in the organization of the activity. This will all be defined once the study is concluded.

Conclusions

Time is needed for adapting the National Cadastre in stages, for carrying out the pending transformations based on State requirement. In 1996 conditions were right for assimilating the gathering of all information required by the Land Balance to input to the Annual Statistical Summary of the National Cadastre, due to be edited and distributed in January 1997. Cadastre certificates will continue to be issued by municipal cadastre offices, for property registration and any taxes that require its presentation.

It is vital to complete the urban cadastre in order to count on exact data bases for houses and empty lots, correctly geo-referenced, fundamental for tax and legal purposes. At the same time it is necessary to implement property valuations. In order to achieve these objectives and all the others touched on in paragraph three of this presentation, all the measures discussed must be set to reform the Cuban Cadastre.

Experience shows that in Europe and America the Cadastre has developed as a multi-functional inventory, whose objective is to guarantee the governments’ control and management of real estate as part of the national heritage.

We have attempted to indicate the importance of exploiting the National Cadastre of Cuba, once modifications have been made to the structure and content, legislation approved, indispensable investments made, and qualified technical personnel re-trained. It will help strengthen the country’s legal system, and help attain higher levels of social discipline in regarding, taking care of, and exploiting the country’s heritage. It will also contribute to equity and generality in application of taxes, and in a more rational use of land resources and real estate in particular.

We wish to thank the Spanish Center of Cadastral Management and Cooperation of Taxation, and the Institute of Fiscal Studies and Latin-American Cooperation, for the co-operation provided since last year which has allowed us to begin to plan the changes required to our country’s Cadastre.

As international co-operation increases we hope to be increasingly successful in acquiring the most advanced technology, equipping our specialization with knowledge possessed by the most advanced countries, and modernizing the National Cadastre according to today’s international criteria.

An objective of our Cadastre service is to establish co-operation with countries of the European Economic Community and the rest of the represented countries here.

We consider that the Cadastre is a fundamental instrument in our present economy and its development in all its magnitude is of utmost necessity.

Organization of Lithuanian land reform, land cadastre and land registration system

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LITHUANIA

Integration of cadastres and registers on GIS base

Land reform

In 1990, when Lithuanian State has restored its independence, a very important, complicated and urgent task which was among other issues that the state had to solve was the restitution of private land ownership. State ownership that had lasted for fifty years changed, in the main, economy system and legal land relations both in the rural areas and in the cities.

According to the laws adopted in Lithuania land reform covers the whole territory of the Republic of Lithuania and the ownership right is being restored in the following ways:
- Restoring previously owned land or forest in kind or granting otherwise land or forest parcels of the same value in another place;
- Granting State lump-sums which can be used in acquiring state property, or granting shares belonging to the State;
- Buying land or forests for each.

The volume of land reform works is very large. According to the information from land surveyors it would be necessary to form about 2.5 - 3.0 million land parcels during land reform and land privatization.

When private ownership was introduced, the necessity to create a reliable land cadastre and land registration system arose. At present with the help of foreign countries a unified land cadastre system is practically, implemented in all Districts (44) and ad-
ministrative Cities (11). A legal land registration system has been created. It is being carried out by the same authorities in 44 Districts and 11 Cities as a land cadastre. Land registration system is likely to be improved when a new Land Register Law is adopted.

At present a bill of Land Register Law is under debate in the Seimas (Parliament) of the Republic of Lithuania.

The speed of land reform and land privatization is not sufficient for the quicker integration in European Union. We need assistance from foreign countries because when it is coordinated with financial resources of our country it speeds the land privatization, helps master new parcel measurements and map production technologies, speeds the registration of land ownership rights, and helps develop the land market.

**Land cadastre**

Land cadastre works are carried out by:
- State Land Survey Institute and others, involved in the land reform works;
- State Land Cadastre Enterprise;
- Districts, Cities Land Management and Geodesy Boards;
- Agrarian Reform Services.

The National Land survey under the Minstery of Agriculture coordinates cadastral works.

Main land cadastre works are:
- Valuation of land parcels;
- Preparation of land cadastre data for the calculation of land taxes;
- Preparation of land cadastre data for the restitution of ownership to owners and land privatization;
- Preparation land cadastre maps and other cartographic materials;
- Preparation of land cadastre summary data for state institutions and Government.

Land cadastre is being established on the basis of the following legislations:
- Land Law;
- Civil Code;
- Land Tax Law;
- Forestry Law;
- Law on Land Reform;
- State Land (with Real Property Elements) Cadastre Regulations, confirmed by the Government;

The main purpose of land cadastre is:
- To form land parcels and mark them on the ground;
- To prepare data necessary, for the calculation of land and land lease taxes;
- To provide reliable information for the restitution of ownership right to land parcels and the privatization of land parcels;
- To produce land cadastre maps.

Land cadastre relationship with the land register:
- A central database in Vilnus
- Close relations established between land cadastre and land register;
- Land cadastre data linked with land ownership are stored in Vilnus and the Districts, Cities Land Management and Geodesy Boards (55).

**Principal factors**

The orthophoto map production technology was selected for its effectiveness and economy. The choice was based on the results of a separate bilateral Lithuanian-French Project «Orthophoto Technology». The project demonstrated the effectiveness of several alternative technologies applicable in Land Reform and land cadastre and provided economic indices to prove strong advantage of the orthophoto technology.

Orthophoto map production is a fast method to be used to cover vast areas with reliable cartographic data. The orthophoto map has the same accuracy as the topographical map and represents the situation in the area at the time of taking aerial photographs. Such a map serves as a base for topographic, cadastral and thematic mapping. The orthophoto method has been chosen as the most suitable one to supply Land Reform processes and cadastral work with a reliable cartographic base. The principal aim of the orthophoto map production is to follow: orthophoto maps will be used as a digital or analogues base for land use or forest management project design, register and cadastre map compilation and used land mapping. The central point is that Lithuanian Laws provide for the title vesting that is based on preliminary surveying, without precise field measurements, where accuracy to the most extent depends on the accuracy and age of base maps. The new orthophoto map will allow considerably increase the quality of preliminary surveying and to ensure fair ownership restitution. The latter conclusion has been based on the results of an experimental work. The main product of the orthophoto map production technology is a digital orthophoto map. As derivative products, analogues orthophoto maps at the selected scale and a Digital Terrain Model (DTM) are produced. DTM is placed automatically during the orthophoto map creation process.

Production of orthophoto maps cannot be separated from development of Land Information System (LIS) and one of its structural parts - a register of titles.
and cadastral of real property. The successful functioning of a land and real property market will depend on the mentioned data reliability.

**Lithuanian - Swedish project «Orthophoto Map Production»**

The project started in 1993. It was preconditioned by the development of land and real property markets and LIS, where property formation appeared to be one of the most significant processes. Both property restitution to former owners and new land property formation is based on orthophoto maps and design of land use projects.

The other very important precondition is the fact that until the Independence of Lithuania, aerial photos were taken by Soviet military organizations. No aerial photos have been taken during the five years of independence. Lithuania has no technological potential for taking aerial photos and they are impossible to develop at the moment due to the following reasons: first, Lithuania is a small country (65,000 km²) and it would not be economical to maintain a unit for Aerophotography and second, development of aerophoto technologies is directly linked to the development of Lithuanian aviation which, in its turn, needs considerable financial investments.

With regard to the mentioned preconditions and circumstances and aiming at harmonious development of LIS (Lithuanian - Swedish Project «Land Information System» lasting for 4 years already), a new project «Orthophoto Map Production» was launched.

In 1995 aerial photos were taken for 14,000 km² of the territory of Lithuania. The work was carried out by Swedsurvey according to the common work plan of flights and measurements of control points for aerial photos, drawn up by Lithuanian and Swedish specialists. Besides, Lithuanian specialists executed inside preparatory work of aerotriangulation, i.e. marked the control points on the copies of aerial photos. Aerotriangulation, transformation of DEM (Digital Elevation Model) and orthophoto recalculation was carried out by Swedsurvey in Sweden. For orthophoto map publishing and their further use in analogous form, the orthophotographic image is not enough. In addition, minimal vector information - points of geodetic network as well as administrative and cadastral boundaries - are necessary. The vector information was developed in Lithuania. For this purpose and with the help of Swedish advices, preparation of standards for orthophoto (1:10,000 and 1:5,000) and cadastral maps was carried out. A digital production line with 11 work places was established for accumulation of vector information and compilation of a data base. This digital technology was introduced in the middle of 1995 within the frame of the Lithuanian - Danish project «Digital Cadastre Production Line» and in fact, had to completely ensure the processed orthophoto map production. This work will continue in 1996 and the planned orthophoto map production scale will be achieved during the first quarter of 1996.

After the development of vector information and its delivery to Swedsurvey, production of both digital and analogous orthophoto maps was put to practice. The scale of analogous maps is 1:1,000 and 1:5,000. For analogous map reproduction, Swedish partners delivered requisite reproduction equipment. The equipment was installed and it will be used for production in March of 1996. Digital orthophoto maps are provided on CDs.

Results of the complete implementation of the Project of 1995 are planned to be as follows:

1. aerial photos covering the territory of 14,000 km², that can be used for general mapping purposes;
2. 500 orthophoto map sheets in digital and analogous form at a scale of 1:10,000;
3. 270 orthophoto map sheets in digital and analogous form at a scale of 1:5,000;
4. DIM (Digital Terrain Model) covering the territory of 14,000 km² (only for the production of orthophoto maps).

The idea is that the contribution of Lithuania to the production process in this project will increase. New plans of the project of 1996 was drawn up with regard to economic and technological possibilities of Lithuania and its striving for gradual introduction of new strategic technologies. With considerably developed sphere of analytical photogrammetry and without any possibilities for orthophoto map production in 1996, Lithuania plan that all the possible work could be carried out in Lithuania. Apart from all the work, carried out by Lithuanian partners in 1995, in 1996 Lithuania carry out all the block aerotriangulation work.

According to the program, 1996 would witness the production of aerial photos covering 18,000 km² of the priority territories. These territories would be covered with orthophoto maps at the scale of 1:10,000 and 1:5,000 (for settlements). The total number of map sheets, based on new flights, would be around 970.

To ensure production efficiency, additional territories of 5,000 km² were also included into the plan of 1996. Those territories were covered in a frame of the project with DMA (Defence Mapping Agency) in 1994 and 1995. This material would serve as a base for production of 300 additional map sheets. Lithuania would finance the block aerotriangulation, measurements of control points and generation of vector information covering all the areas. Realization of the program of 1996 would end in 50% of Lithuania covered with new orthophoto maps.

**Training and Pilot Project**

In the program of 1996 a special significance is attached to the pilot project. The objectives of the pilot project comprise the effective use of digial and analogous orthophoto maps for cadastral and base mapping. The pilot project is necessary for efficient employment of project results of 1993 and 1996. A successful implementation of the pilot project would to a very great extent determine the efficiency of the overall orthophoto map production, project.

Digital and analogous orthophoto maps have different use possibilities and require a special competence from the staff. The first users of orthophoto maps land surveyors should have relevant knowledge of orthophoto map application possibilities and should be able to exploit them. There is no clearly defined technology on the use of orthophoto maps for project design and cadastrum. Therefore, a new pilot project is necessary to strike a balance among different technologies and to prepare relevant directives and rules. Majority of land surveyors working with Land Reform are not completely aware of computerized project design systems. They by all means have to be trained to use orthophoto maps in project design work. During the pilot project, such technologies would be worked out and implemented and a group of specialists would be trained to work with them. The specialists would pass their knowledge and experience to other specialists.

Another very important point is that orthophoto maps in Lithuania could be successfully used not only for base mapping, but also in other spheres of activity such as forest management. Organizations of forest management are open for cooperation in the sphere of effective orthophoto map use and land production. However, to achieve such cooperation, all possibilities of orthophoto map use have to be demonstrated and tested in real life. Even though the possibilities seem to be theoretically acceptable, lack of real life experience, unfair evaluation of existing competence and potential could make the application of orthophoto maps in various spheres quite complicated. The pilot project would speed up this process and would enable the use of the latest material in the production process.

Another very important issue not only for the pilot project, but also for the whole project of orthophoto map production in technical means. Orthophoto maps require lots of computer resources. The National Land Survey within their financial limits, will invest in such technical means to ensure a successful realization of the project.

**Integration of various cooperation projects to ensure orthophoto map production and use**

As mentioned above, to ensure orthophoto map production, the attempt is made to employ all the possible resources and data, even though acquired through other projects. Every project has its individual aim, but it is efficient to use their results to guarantee a successful achievement of priority projects.

The common Lithuanian-French project allowed to produce an economic evaluation of various technologies for achieving the goals of land cadastral and Land Reform. The outcome of the project is as follows: orthophoto map production, as the most efficient in the present economic situation of Lithuania, was selected to be a priority activity.

The goal of the common Lithuanian-Danish project was to establish a digital cadastral production line that would process vector data, necessary for the production of highly demanded orthophoto maps. This production line is not sufficient and is developed through other projects.

The PHARE Project «Land Information System» is also partially concerned with further development of the digital cadastral production line and would serve the above mentioned aim.

The common project with DMA (main objective - production of topographic maps) allows for a chance
to use aerial photos and other materials for orthophoto map production (3 000 km²).

Therefore, objectives of other projects were as closely as possible adjusted to the common Lithuanian - Swedish project «Orthophoto map production».

Projects for orthophoto map production in Lithuania

Having in mind that orthophoto map production is one of the most efficient technologies in the sphere of cadastral and mapping, Lithuania is aiming at its development. The technological equipment is expensive and its introduction is complex from the economical and professional point of view. The study of the possibilities for technological development started even at the beginning of 1995. The attempt is made to do this work through the bilateral projects with foreign partners and PHARE.

In 1995, negotiations with Switzerland started concerning their possible assistance to the introduction of map production and publishing technologies in Lithuania. At the same time this technological line could be used for publishing of orthophoto maps. In 1995, the assistance for obtaining field surveying equipment through PHARE was reduced. The reminder of the financial assistance was allocated for the establishment of the initial technology of orthophoto map production. The planned funds would only allow the purchase of the equipment for the production of digital orthophoto maps and a corresponding retouching of specialities. However, publishing of analogous orthophoto maps, so necessary for the majority of users, is only possible through the project with Switzerland or some other bilateral partnership.

With regard to the structure of project implementation by PHARE, the requisite equipment is expected at the end of 1996. Having in mind the remaining of specialists, preparatory work for the production of digital orthophoto maps would take 6 months. It can be expected, that in the middle of 1997, Lithuania will start the production of digital orthophoto maps.

Lithuania and other countries cooperation prospects for 1997 would allow a partial production of orthophoto maps and, if circumstances allow, publishing activities. The scale of the project in 1997 is expected to remain similar to the program of 1996, as the contribution of the Lithuanian partners to the project would amount 50-60%. The Swedish contribution should mainly comprise production of aerial photos and technological development of orthophoto map application.

Integration of cadastres and registers on GIS basis

This is an ongoing project in Lithuania started in 1995. The project accumulates available people resources from various organizations such as National Land Survey, Geological Survey, Ministry of Environment Protection, Ministry Physical Planning Department of Culture Heritage, Ministry of Transport, etc. The project is supervised by the Ministry of Communication and Informatics and managed by the private company HNIT-BALTIC GeoinfService.

The project idea is to establish the organization and management structure for the most effective use of geographically based information. At present the state cadastres and registers are maintained in separate organizations. To fulfill their tasks every cadastral and register collects geographically based information using different map sources. It raises often a work duplication and inadequacy of the same geoinformation in different cadastres or registers. Often it is so that even different classification of the same geographic features is used raising a problem of data heterogeneity. Consequently, the project was started to harmonize all the processes around geoinformation in different organizations. It concerns all the related questions to fulfill main task of the project and namely standardization of geographic features, technological solutions, organizational questions, data flows and procedures.

In practice the project idea gives a completely new point of view to the mapping in concept. Geographical Information System (GIS) gives us a good opportunity to look at the map as an geographically based information source in general information system. No more map should be used (even in computer) just as a map, but it should support solving of practical informatic tasks. The main engine of changes in the real world is a human activities that in turn are legalized by means of physical planning. All the changes of the real world should be formalized in a cadastral as general. So, mapping is a part of physical planning and cadastral. The so called mapping circle for map renewal is also important in a new concept because of natural changes in the real world. In this case it concerns geoinformation renewal in general integration process. It will mean that any organization working in certain area is responsible to update specific features in general geoinformation system and a general geoinformation renewal within a certain period of time will be performed as well, where no human activities are presented.

Integration of cadastres and registers based on GIS practically concerns any organization dealing with maps in additional understanding or information derived from maps. So, it is quite complicated and complex process. This project is to give a conceptual model of integration and gives guidelines for implementation. The implementation process will need some time and will be performed step by step. Changes in legal base are necessary and should be made at first in accordance with integration idea. Implementation demands also a lot of investment in technology that could very problematic at present. Generally, it is expected that the integration will allow to save a lot money as well. Estimation of cost performance should be made within the project as well.

Valuation of Real Estates and Cadastre in Slovakia

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The origin and subsequent development of cadastre of real estates were influenced by practical needs of both individuals and state administration. The effort to make clear the boundaries of real estates, to find out their value and to have the rights to them registered can be seen as common, not only for owners but for other persons entitled to the rights to real estate as well. On the other hand one of the basic state's interests is fairness of levying taxes on real estate according to their kind, quality and way of use.

Taking into account the fact that valuation of real estates is unavoidably connected with cadastral data (or real estate register data) I have no information, whether the Slovak cadastral value will be presented in another working papers within the workshop. I see no other choice than due to better understanding of related problems in Slovakia to mention also a few historical as well as present facts referred to the Slovak cadastral.

In the paper are used terms «plot» (piece of land), «real estate» (piece of land or building) and «parcel» (piece of land delineated in the map).

History

Before 1918

Originally, the cadastral in Slovakia had been developing within the Hungarian Empire. So on territory of present Slovakia the origin of the cadastral land tax can be traced back to the year 1342, when king Charles I. started to pay tax for each piece of land pertaining to the certain house. The tax was called «Lucrum Camarae» and was levied according to the king's discretion.
32

each purpose. Property rights purposes were covered by the agreements, contracts, and deeds. The land register map was kept as the actual state after establishment of the land register.

The land register was maintained as an inventory which recorded data on each parcel, on each plot, data connected with the land and its way of use.

The land register implied a lot about the owner of land, about his rights and facts that influenced these rights (morgages, warranties, easements). All real estates except the so-called public property (roads, streets, squares, public gardens, drains, etc.) the so-called non-registered property entered the land register. The land register map was a part of the land register.

The land cadastre was primarily the state land inventory. It provided information on all-round surface characteristics of the country on basis of information on particular plots. The land cadastre implied the dimensions, shape, location and circumference of each registered plot. The principal attributes of the inventory were area, sort of plot, value of plot (cadastral yield).

Generally speaking, the original registration tool was of single-purpose with the function of registration of ownership rights and the function of application to tax purposes. An individual inventory was kept for each purpose. Property rights purposes were covered by the public registries (land register as well as a less frequent railway register, water register and mine register) while the land cadastre served to tax purposes.

The land cadastre was an institution built up on former fiscal cadastres.

Taxation of land had developed from taxation of large agricultural areas (used as tax units) to taxation of particular plots. Land tax was levied according to the so-called net cadastral yield of plots, that was an arithmetical product of the plot area and the rate stated for net yield of area unit for various kinds of plots and various grades (classes) of fertility (value of soil).

Both classifications of plots according to their kind and quality and calculation of net yield of the area unit for various kinds of plots and for value changes were carried out in the basis of the cadastral valuation. For a better illustration, the original basis for taxation was determined without any maps. This matter had not changed sooner than in 1856 when the cadastral measurement was initiated.

The former Austrian and Hungarian cadastres (and consequently later the Czechoslovak one as well) were the parcel based systems that recorded the yield ascertained by the classification. The parcel cadastre was able to give a graphic representation when the measurement was required and, moreover, it had an advantage of stability of the land use.

The other milestone in the land valuation in former Hungarian countries was the legal article No. VII on modification of the land tax and administration of the land cadastre in 1875. According to that article, the Ministry of Finance decreed the calculation of net yield and its entry into the cadastral register of land tax as well as creation of the original operators of cadastral valuation. ' liaxable cadastres' (the forefront of land cadastre) the plots were classified into taxable and non-taxable ones. The fields, meadows, vineyards, pastures and forests ranked among the taxable plots, while the plots of other than agricultural use, industrial plots, rocks, public tracks and roads, rivers, canals and cemeteries belonged to the non-taxable plots.

In the Hungarian Empire the cadastral map had exclusively served for the tax purposes up to 1886. After the legal article No. XXX/1886 on the establishment of land register system was issued, the copy of cadastral map that represented the actual state after establishment of the land register assets became the aspheric map of land register. The area and cadastral yield of parcels were marked in to the maps according to the operator of the land plot. This way the cadastral map has converged to the land registers and both institutions became dependent on each other since 1886 (the united operator). The cadastral map was no longer an exclusively tax character and at the same time, it became a tool for legal arrangement of real properties.

1918 - WW II

As soon as in 1918 after establishment of the Czechoslovak Republic, efforts occurred to integrate the land cadastre with the land register into one public register owing to its legal importance. However, the public had to wait for implementation of the given intention for several decades. A precondition of establishment of a technologically more sophisticated land cadastre was created only by the cadastral law No. 177/1927 Coll. Acquiring of the ownership rights to real estates continued to be tied up with the entry to the land register which preserved its constitutive character so the cadastral measurement was still accepted.

From point of valuation, the act introduced a change in provisions concerning the classification of soil value. The act stated that the land cadastre is geometrically represented, list and description of all plots in the Republic and it has to serve as a basis for levying public taxes and rates related to plot tenure. Among the subjects of cadastral ascertainment, there were also the cadastral yield (ratio number expressing the proportionality of the soil and so its economic value used when determining the basis for taxation, determining the compensation in the cases when the plot was expropriated by the state, determining the court and inheritance charges, writing the storage bonds etc.). Types of soil value classified and the land cadastre plots (both with and without cadastral yield). The cadastral valuation of plots executed in the Austro-Hungarian monarchy and its results were adopted, nevertheless, no valuation has been carried out in the past. Classification was carried out by comparing the outer features of the plot to a pattern plot. For each pattern plot was required a pedologic analysis of soil and at the same time the general data on the country, plot location and soil characteristics were ascertained.

Despite the fact that activities connected with building of cadastral and land registers went on for more than hundred years and demanded vast financial costs and huge amounts of work, they did not result in a homogenous and reliable basis for the cadastral of real estates.

WW II - 1964

After the World War II the conditions of two registations tools, the land cadastre and the land register were not good. On half of the territory the operation of the land cadastrc was not founded, a considerable part of the cadastral operators was not projected into the land register by contribution doings, a considerable part of the cadastral cadastres were not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not good. On half of the territory the operation of the cadastral cadastres was not projected into the land register by contribution doings, a considerable part of the cadastral cadastral cadastres was not.
ment of geodesy and cartography was entrusted with registration of ownership relations to the immovable assets. However, in reality this registration covered only the built-up areas as in the collectivized forest and agricultural rural areas the use relations were registered instead of ownership relations to real estates. From 1964 up to 1992 dealings and making decisions on registration of agreements were conducted by a body of judicial character - the state notary's office and only the agreement registered there could be projected into the real estate inventory.

One of the main functions of these laws was to suppress the owner's consciousness of his ownership rights and to prefer the use relations to the real estates in the collectivized rural areas. The set of their functions lacked the role of protection of the private property.

Present state
Cadastre of real estates after 1992

New legal regulations valid since 1 January 1993 (Act No. 266/1992 Coll. on the entries of the ownership and other real property rights and Act No. 266/1992 Coll. on the real estate cadastre in the Slovak Republic), respectively since 1 January 1996 (Act No. 162/1995 Coll. about the real estate cadastre and entries of ownership and other rights to the real estates) completed more than twenty-year long effort to change the previous law. It was only granting of equal rights to all forms of ownership, restoration of social importance to the ownership relations to real estates and inevitability of reinforcement of the legal state's functions after November 1989 that enabled successful accomplishing of these efforts. The new enactment has been built on three basic principles:

- principle of constitutionality (i.e. inubilation principle) of data entry into the cadastre (the real estate ownership right originates by resolution of the cadastral office about the entry contribution to cadastre),
- registration principle, according to which entry - record in cadastral has a registration significance,
- information - presentation principle which is manifestly the notice.

The new enactment has adopted integration of two previous registration tools (land cadastre used for real estate registration and the land register used for recording the ownership relations to real properties that have not been updated since 1951) into one single tool.

One of the delisted objectives according to the new enactment is the supply of data for tax purposes and for valuation of real estates.

The area of Slovakia is 49,036,040,000 m². There are approximately 5 million registered real estates that physically exist in the field in Slovakia and 1,900,000 of them are in rural areas. These rural real estates (that has originated mostly since 1949 as a consequence of collectivization) consist of more than 9,000,000 original plots that belong to their original owners or their heirs. The basic problems is that boundaries of original and present plots usually do not correspond (the present plots were not created according to boundaries of original plots). This legally and technically complicated (and unrobable) situation has been temporarily solved by existence of two systems of recording the legal relations to real estates both original and physically existing ones in the field. That is the reason why two kinds of maps are used and this situation makes also valuation of real estates more complicated.

We rank among our crucial problems the unbesale

able fractionation of land ownership that has even increased since 1994 due to the fact that splitting of plots in the case of inheritance has not been regulated. There are frequently unbelievable co-owner shares registered in cadastral (e.g. in cadastral area Ruzina district cadastral office is registered a share 98 800/14 749 560 on certificate of ownership No. 209).

Presently, there are 2,948 municipalities and 3,520 cadastral areas in Slovakia. The original real estates are delineated on circa 40,000 map sheets and the number of continually updated cadastral maps displaying really existing real estates in the field is similar.

For running of cadastral information system the PCs were introduced (practically for the whole set of descriptive data) in 1992. In 1995 we began to convert graphic information into computer readable form (and update by means of computers) and within the year 1996 we managed to convert maps from circa 140 cadastral areas (4% of the total area of Slovakia) into cadastral office about the entry contribution to cadastre exists in the field. That is the reason why two cadastral has a registration significance.

The new enactment has been applied to all areas to elaborate an assessment) are no exceptions.

An existence of any market is possible only on condition of presence of market principles and respecting of market relations. Much like on the stock market, the principles of supply and demand function also on the market of real estates. Many a factor influences the value of plot. They are especially, the fertility of land (interessing mostly with regard to agricultural and forest plots), the level of urbanization and its prospects, the availability of communications and utilities (gas, electricity, water supply, sewage system) etc. (interesting for plots in urban areas). An important factor in determining the market value of the plot (or real estate) is the legal purity of previous legal transactions: a real estate value is difficult to sell the plots that are disputed or encumbered. The revival of real estate market can be illustrated on the amount of contracts of purchase. While before 1992 the state notaries used to register circa 40,000 deeds in Slovakia per year, after the new cadastral legislation came into use (in 1993) the amount of affirmative resolutions on contribution into cadastre was as follows: (see chart on pág. 57).

Similarly to the former status, even if the value is assessed by an expert (valuer), the market price of real estates being sold is a matter of agreement between buyer and seller. Thus market prices based on agreement are according to the preliminary poll different from those assessed by experts (valuers) in 94 per cent of all cases. The cases when the actual price is even several times higher than the value assessed by experts (who use besides others the quantitative cadastral data - area to elaborate an assessment) are no exceptions.

Evaluating soil-ecological units

A consequence of application of overcome and no longer fashionable Marxist theories (claiming that the price of land cannot exist only the true value can be caused that it is not goods), was the fact that the land's yield was not long ago principally neglected. In spite of mentioned above the practical needs called for a definition of new qualitative characteristics.

In 1972 the Czechoslovak Federal Government launched the process of 'Valuation of agricultural land fund in the Czechoslovak Socialist Republic'. Its main task was to acquire results usable not only for tax purposes but especially for agricultural purposes of the central planning and protection of land fund as well.

Evaluating soil-ecological units are represented by the seven-place code with following meaning (see pág. 36).

The definition and graphic representation of evaluated soil-ecological units in state map series x the scale 1:5000 is a demanding job but as a tool for valuation of plot it is only an auxiliary information.

Valuation of real estates

Official value of agricultural land is derived from the value of each evaluated soil-ecological unit and these values are stated in the Decree of Ministry of Finance of the Slovak Republic No. 465/1991 Coll. on prices of buildings, plots, permanent growth, charges for establishment of the right of personal use of the plots, (this form is used no more legally exist and it has been replaced by ownership right) and compensations for temporary use of plots (replaced by lease) - in the version of later rules. This value is applied anywhere provided an individual (market) value of land cannot be applied, especially for:

- statement of basis for taxation of real estates (plot),
- calculation of inheritance tax, transfer tax, gift tax,
- calculation of income tax (when property is sold),
- calculation of compensations when land is expropriated for public purposes,
- reallocation of plots or their changes in the process of land consolidation,
- calculation of charges for removing of agricultural land from agricultural land fund,
- valuation of real estate when the Act on Bankruptcy and the Failure is applied,
- calculation of administrative fees.

The value of the arable land, hop gardens, vineyards, orchards and permanent grass grounds is computed as an arithmetical product of the value of evaluated soil-ecological unit per 1 m² and the area.

The value of forests plots is computed as the sum of the basic value of forest plot according to the type of growth and the value of location factor (the approaching and transport distances). The minimum value of forest plot to 0.30 Sk per 1 m².
As far as other than agricultural land is concerned, the Decree on taxes states the basic rates in SK per 1 m². In cases of plots intended for construction or for establishing a garden or plots that are recorded in real estate cadastre as a built-up area, courtyard, garden and the like, the rates are as follows:
- 1.500 - Sk in Bratislava, the capital of the Slovak Republic
- 800 - Sk in Košice, Banska Bystrica, Piestany, Stary Smokovec, Strbské Pleso, Tatranská Lomnica and in Trencianske Teplice,
- 500 - Sk in Trnava, Trnica, Nitra, Zlina, Prešov, Poprad, Zvolen, Liptovsky Mikulás and Manin,
- 1.500 - Sk in municipalities with more than 12,000 inhabitants,
- 100 - Sk in municipalities with more than 5,000 inhabitants,
- 70 - Sk in municipalities with more than 2,000 inhabitants,
- 20 - Sk in other municipalities.

The value of a family house is calculated as the sum of valuations of particular stores (according to area and assessed number of points; value of 1 point is 1 Sk). The value of the building is influenced by depreciation (1 year is equal to 1% but the maximum reduction is 80%). In case of other residential houses the reductions are considered (coefficient 1.00 - 0.85) according to the area.

The value of an apartment including the amenities and share in common pans and other building features is calculated according to the apartment category as an arithmetical product of the value per 1 m² (5,300 Sk - 2,200 Sk) and the area consisting also the depreciation and the attractiveness of location.

The value of 1 m² of a non-residential room is 5,300 Sk.

The value of a weekend cottage, garden cottage or a garage is calculated similarly to that of the family house. It is supposed to pay the tax, or secondly, who has the right to administer the state’s property, the municipal property, tenant or lessee. It is worth mentioning that real estate tax is paid only if it exceeds 100 - Sk within a fiscal period. There are of course many exceptions from paying taxes from real estates for schools, hospitals, nursery schools, municipalities, state autonomies, parks, cemeteries, etc.

In practice, arable land is taxed in a way that an average value on the basis of presented evaluated soil-ecological units is calculated for every municipality (one or more cadastral areas) and from this value a financial equivalent per square meter for taxation in every municipality is determined.

Who is entitled to evaluate real estates?

Valuation of real estates is performed by experts (valuers) who are qualified to do it. Actual process of valuation is regulated in the Act No. 317/1992 Coll. of real property tax. Any citizen of the Slovak Republic can be appointed the expert (valuer) on the basis of his employer or other organization's proposal or as the case may be on the basis of his own request. The expert (valuer) is appointed by the Chairman of the Regional Court (there are 3 Regional Courts in Slovakia) or by the chairman of the Town Court in Bratislava. Employees of universities or central bodies of state administration are appointed by minister. The expert (valuer) is supposed to be practised (at least 7 years) in chosen field of activity. From 1995 only a graduate of so-called Lisková School at the Institute of Court Engineering in Zlín can be appointed the expert (valuer). The experts (valuers) are examined once in every 5 years by means of certificate examinations. In 1995 Slovak experts (valuers) became members of the international association of experts that produce certificate examinations every 2 years.

Assessment of market value in process privatization is performed only by an expert organization appointed by the Ministry of Finance of the Slovak Republic. List of these organizations is regularly announced in the press. List of experts (valuers) is available at the Regional Courts and anyone can obtain the name of expert (valuer) according to required qualification for a fee in case of interest. Experts (valuers) are entitled to elaborate assessments for private persons (for inheritance, restitution, mortgages and other purposes) but primarily they are obliged to elaborate assessments for requirements of courts.

Disadvantages of present state

Present system of taxation on basis of tabular (and not market) value does not guarantee the fairness in taxation and was chosen only for a temporary period. This disadvantage is more or less compensated by various rates, surcharges and coefficients, what is criticized especially by municipalities and towns. The Act No. 317/1992 Coll. on real property tax does not create preconditions for regulation of inner urban proportions in relation to territorial and economic development of urban areas. This state is caused by an absence of value criteria in the process of calculation of tax basis. The values of plots do not consider factors such as location of plot, attractiveness of locality, etc.

Real estates of different market value are frequently taxed equally. Insufficient pressure is exercised on economical use of real properties.

Original intention to assess values of real estates on market price basis (sales comparator approach) has proved to be unreal in our conditions. From available information it can be seen that despite the revival of real estate market only some 0.1 - 0.5 % of all plots is sold per year. In such a way one would not be able to elaborate one land value map earlier than in 100 years time and samples in 50 years time.

One of the basic problems that originated in the process of creation of evaluated soil-ecological units system seems to be the fact that boundaries of evaluated soil-ecological units were chosen in the field to define particular soil areas without any relation with boundaries of rural parcels registered in cadastre: the only exceptions were boundaries of forests, of important waterways, of cadastral areas or sometimes also at boundaries of built-up areas. Consequenly, one parcel may consist of more kinds of evaluated soil-ecological units. Actual information about detailed occurrence of evaluated soil-ecological units is assembled and provided by local land offices and this process is performed on the basis of sampling method containing of map sheets containing evaluated soil-ecological units and related copies of cadastral maps (in coincidence with new regulations, the cadastral authorities are going to take over the responsibility for administration and providing this information and this process should be performed mostly when the results of land consolidation will be incorporated into the cadastre).

Our experts (valuers) are more or less experts for valuation of buildings and not plots. Obviously, the Decree No. 465/1991 Coll. underestimates valuation of plots and only 14 various coefficients are applied to valuation of plots and this, of course, harshly influences the quality of assessment.

Future

It is obvious that introduction of a perfect or fair model of valuation and taxation is extremely difficult.
There is an effort to introduce the value register of real estate and to elaborate the value maps in Slovakia. This effort is required for taxation purposes and simulates use of area from cadastral.

There are more elaborated samples of value maps in Slovakia at present, but the approval of the Ministry of Finance is prior to their use and they have not been approved yet. For example, a proposal of land-value map for Bratislava is comparable with the land-value map for Bino - the Czech Republic described in the Theory of Valuation (Koča, P., 1991). The project of creation of value registers and value maps is being prepared within broader intentions of the Ministry of Finance. Regardless the formal form of approval, it is obvious that there will be a direct relation between the cadastral authority and the process of valuation. One of the main tasks of the authorities is to introduce a fair taxation (to pay a higher tax from the real estate of higher value and vice versa).

To elaborate the proposal of the new system for taxation of real estate, determination of basis for taxation is the key question. Several countries (USA, Denmark) are said to determine this basis as the capital value of the property defined as the possible annual income from the future possible rent. The result of the comparison of the two methods of estimation is that when using rental values an actual use of the property is considered whilst capital value is derived from the future possible benefits of property ownership.

Taxation of real estate according to the area has advantages of objective comparability and administrative simplicity. Comparatively, a small amount of disputes with tax payers follows from such taxation. On the other hand, taxation based on a basis value has advantages in higher rising tendency and better fairness provided that frequency of revolution is sufficient.

Among a part of experts prevails an opinion, that taxation of real estates according to their value should proceed from the value maps system that has already been elaborated and is based on the methodology of the Point Value Differentiation. This methodology can give a real picture about different conditions of plots resulting from 6 basic factors (location, technical infrastructure, environment, buildings, terrain and attractiveness). It comprises evaluation of more than 100 basic territorial, technical, social, economic and natural coefficients influencing the different value of points from which is derived the general value.

This methodological solution of point differentiation of the territory is based on knowledge of international experiences gained in developed countries and on comparison with methodological validation with incorporation of special features resulting from the domestic knowledge. The values derived from the value map would serve for purposes of the market estimation of plots as the recommended price for the price negotiation. Modifications of the point values should be determined by the Ministry of Finance depending on inflation and stability of the currency. The result as the basis for taxation should be the Value Map of Towns and Municipalities. After comparison of points with the financial values, this map would turn to a value map with financial equivalences.

Creation of value registers and value maps is a prospective method that repeatedly lays demands on the input/output of real estates cadastral from points of both reliability and form of computer processing.

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Valuation of Real property, land-cadastre and land-register in the Republic of Slovenia

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Valuation of Real property

A piece of land, called a parcel, is shown on the cadastral plan with its shape and situation on the site. In the attribute part of the Land Cadastre, a parcel is performed with its size, cadastral classification and yield per hectare as a taxation base.

In the evidences of the Land Register a parcel belongs to a known owner of the real property.

So, a parcel is a unit in the legal transfer of the real estate or of the real property.

After the second world war also in the Republic of Slovenia (at that time a part of the former Yugoslavia), the state property of large all real property was introduced. For farmers and owners of one family houses and flat allows allowances were done.

In spite of the above mentioned changes, the legislation of running the Land Cadastre and Land Register remained in general unchanged.

The valuations of the real property have been done by the legally authorized real property valuers on the base of the legal methodology and legally determined prices per unit.

A state financial control was done at the transfer of the property, where on one side was the State itself.

It is interesting to notice in the continuance of the transfer of the property the data of the Land Cadastre and Land Register database have been used.

Since the attaining of the independence in 1991, the Republic of Slovenia has the private property of the real property have been introduced again.

According to the restitution and influence of the free market, the valuation of the real property split into two directions:

1) Valuations, or better to say, collecting the real property values for the sake of the free market.
110

square meter of land at the nation and partly of two values: the expropriations. In the case of restoration, the 
price could be:

1. administratively determinate, or
2. freely formed.

Administratively determinate were prices per square meter of land at the nationalisation and partly at the expropriations. In the case of restoration, the prices of land are administratively determinate as well. Freely formed price per square meter of land is the market value.

2) Surface (area) of the parcel: Surface of the parcel

is the data from the Land Cadastre database. Data from the Land Cadastre database depend of the year of calculation of the surface.

The most accurate are the surfaces, calculated according to the new technical regulations from 1974.

Land use and land classification data: Due to legal regulations the agricultural expert should determine the land use and the land classification data of every land parcel. This is not so should be.

These cadastral data are not up to date. On special request of the landowner these data are determined by the agricultural expert.

For the time being in Slovenia there are some 250 real property agencies and agents. The first market of the real property in Slovenia is still new, unsettled and dispersed. Since 1994 some agencies have been organized in an alliance - real property stock exchange. They have organized a database for some 120 real properties.

Due to the fact, that the Land Register is not completely digitized to the Land Cadastre, the data of certain number of the real properties could not be completed.

A special problem are the big flat settlements, not entered into the Land Cadastre and Land register evidence.

Real property stock exchange cooperates with the Slovenian Real estate Association. This Association is a member of the FIBACI - The International Real Estate Federation.

The last legal methodology has been in force since 1967.

Methodology for the determinate of the value of the agricultural land and forests:

- Regulations for calculation of the values of houses, flats and other real properties.
- Value of the agricultural land is determined on the base of pointing. Value of the forest is determined according to the value of the land itself and to the value of the trees.
- Value of the buildings and flats is fixed as the value of the real building costs.
- Value of one square meter of a new flat, built by the state construction firm, is prepared by the political communities at the beginning of each year. The value of the community infrastructure costs is prepared in the same way.

Unions of the building industry and building materials, monthly publishes rating of building costs. Building parcels are divided into built and unbuilt building parcels. Their value depends of their location.

In all judicial cases divorce, inheritance, reimbursements (compensation) - the appraisal of an valuer are demanded. These valuations base, as well, upon the data of the Land Cadastre and Land Register database.

At the property transaction, the owner usually want to know the official value of their property.

Real property valuers in Slovenia are organized in a professional society which takes care of improvement of our work.

The Slovenian Real Property Association is a member of the FIBACI (International Real Estate Federation).

We hope as well, that the Slovenian valuers will join to the European TEGOVOFA not before long.

Land-cadastre and land-register

A piece of land, called a parcel, is shown on the cadastral plan with its shape and situation on the site. In the attribute part of the Land Cadastre a parcel is performed with its size, cadastral classification and yield per hectare as a taxation base.

In the evidence of the Land Register a parcel belongs to a known owner of the property.

Republic of Slovenia, a state in the heart of Europe, covers 2.025,666 ha and is divided into some 5,400,000 parcels. On some 3,100,000 parcels the agricultural production is possible.

Republic of Slovenia was till 1918 a part of the Austrian-Hungarian Empire. In 1883 the decree of the Austrian-Hungarian emperor the very beginning of the technical measurements for the sake of the land cadastre in the Empire was settled down.

The whole territory of the Empire was covered with local rectangular coordinate systems.

Territory of the present state of Slovenia is covered with three local rectangular coordinate systems. The points of intersections of these systems are trigonometrical points of first grade from Lubiana, Schoedede near Graz and the church tower of Saint Stephen in Vienna. Systems have no cartographic projections. Y-axis is oriented towards west and X-axis towards south. Own trigonometrical geodetic networks were developed in the frame of each local system.

Till 1832 for the region of the present state of Slovenia the geodetic network, detailed measurements of land parcels and drawing of cadastral plans at scales 1:146, 1:2380 and 1:3760 were done as well.

The representatives of the community have signed mutually agreed limits of properties before the detailed measurements were done. Measurements were done on the plane table. The most accuracy was paid to the representation of the limits of property on the plans.

From 1832 till 1846 these cadastral plans were not maintained, and the government decided for the completion of the plans.

According to the instruction from the year 1856 the new cadastral plans were done and the parcels renumbered.

In the year 1893 the Land Register was established with the decree of the emperor, on the base of the register of title. The Land Register records the names and material rights of the owner or owners of the property. Through land register ensures the legal protection of the inscribed rights are executed. At its foundation the Land Register got the copies of all land cadastre plans of its territory. Land Register and Land Cadastre together assure that no real estate or real property transaction could be done without paying the necessary taxes.

And since 1883 the maintenance of cadastral plans in accordance with the registered property has been going on. The Land Register is still kept manually and does not correspond completely with the evidences of the Land Cadastre. The records of all field measurements since 1883 have been carefully saved by the branch offices of the Geodegetic administration. The particular significance of the stored records was evident at the occasion of restoration.

In 1929 the Gauss-Krüger conform cartographic projections of median zones for our state have been introduced.

Maintenance of all cadastral data was till 1979 done by hand. Cadastral evidences remained behind of the real situation for one to a year.

Cadastral plans were from the beginning till day 1975 printed and maintained on sheets of printing paper. Since 1975 a lot of cadastral plans in Slovenia have been printed on plastic folios. Since 1975 the aerophotogrammetry has been used for making cadastral plans.

Since 1974, according to the Geodegetic law, regulations of the limits of the properties could be done only with the written mutual agreement of both sides (i.e. fenced boundaries). Besides, in anyway possible, measurements must be connected to the state geodegetic Gauss-Krüger networks.

Plans at scales 1:1000 and 1:2000, covering some 10% of the surface of Slovenia, were completely done according to these regulations.

On these plans the corner points of the parcels - so called land cadastre points are located with their Gauss-Krüger coordinates.

Along fixed boundaries no more judicial conflict for the boundary is possible.

We are sure that such a way of running the land cadastre is one of the most modern ways of this kind.
In October 1991 the Surveying and Mapping Authority of the Republic of Slovenia has initiated the project Computerization of Geodetic Records of the Republic of Slovenia. Methodological and technological solutions for establishing and maintaining of digital databases were prepared - among many others - for the Land Cadastre first of all.

Our goal - to make new numerically based cadastral plans for the whole territory of Slovenia, representing the fixed boundaries, will require much time and above all it will be very expensive.

So, we have decided to build up a digital Land Cadastre. A digital Land Cadastre means computer keeping of the graphic part of the Land Cadastre data (i.e. location data) and join them with the already built up attribute database into one single digital Land Cadastre database.

Digital land cadastre includes:

- computer keeping of the attribute data of the Land Cadastre,
- computer keeping of the location data of the Land Cadastre,
- computer keeping of the history of the parcels,
- computer keeping of the attribute and location data of the Land Cadastre points,
- computer keeping of the history of the attribute and the location data of the Land Cadastre points,
- computer keeping of the administration of the Land Cadastre office,
- computer keeping of the evidence of the elaborations (records of previous measurements),
- to build up the base of changes,
- connection with the classic files of the Land Cadastre.

Program packages deal with the separate parts of the digital Land Cadastre (DLC)

- Base of data of the DLC kept and maintained are the attribute and location data for the parcels Land Cadastre points and points of the geodetic network,
- Base of changes: collected and maintained are the data about title plans and legal changes of the parcels,
- Register of working procedure: attended and registered is the whole administration of the office. Finished works are kept in the separate PP Evidence of the Elaborations. The register of working procedure is the functional link between the base of data, the base of changes and of the files.
- Files: also in the future the classical way of running the files is foreseeable.

With these program packages the step by step transition from classical to the digital Land Cadastre will be enabled.

On all Geodetic Administrations in Slovenia the below mentioned digital data are already kept and maintained:

- database and the history base for the attribute data of the parcels,
- database of all geodetic network points,
- database and the history base for the Land Cadastre points (i.e. corner points of the fixed boundaries),
- digital evidence of the elaborations (i.e. records of the previous measurements). This program package (PP) enables making the evidence of the previous measurements since 1883. This PP can work alone or in the linkage with the PP register of the work procedure.

All the data of these databases are issued to the customer with no delay.

PP register of the working procedure is already over the testing phase. As already said, the attribute data of all the parcels are already kept and maintained on computer by every branch geodetical administration. Common attribute database for all parcels of the whole Slovenia is kept and maintained by the Geodetic Information Center. Updating of the central database is being performed with diskettes, direct connection of Central database to the branch administrations is in the phase of gradual implementation.

This central database for the whole Slovenia is our big effort and great success. For 3% of the whole amount of the parcels also the location data are available with no delay.

Nowadays we are working on transformation of printed cadastral plans into digital form. So, the customer will get the copy of the plan with no delay.

The link identity code between the both records, the Land Cadastre and the Land Register, is the number of the parcel in the frame of every separate land cadastre community. Both records are by law defined as state records and are maintained regularly.

For the time being, the Land Register does not follow the modern development of the running of the Land Cadastre and is still kept by hand.

Land Cadastre relates to the Ministry of the Environment and Physical Planning, the Land Register is under responsibility of the Ministry of Justice.

Taxes based on real estate value

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LATVIA

Short Geographical Background

Latvia covers the area of 64,585 km² and is situated on the South - East coast of Baltic Sea. The population of Latvia is 2,686,000 and a half of it lives in or around Riga the capital city. The Latvian landscape was formed during the Ice Age and varies from flat and undulating lowlands to hilly elevations. The dominating height is 50 to 150 m. above sea level (see pag. 66).

Historical Background

Looking back we can see that the history has not pampered the Baltic nations and the inhabitants of Latvia. Latvia was faced to lie in the geographical crossroads of the last European wars. The nation saw four agrarian reforms during the last 200 years. Latvians were serfs deprived of any rights in the 19th century, but they managed to become prosperous farmers by 1939 possessing 70% of all the land.

The land reform currently going on in Latvia is the fourth agricultural reform in this territory. The first agricultural reform (so called «Peasancs reform») started with abolition of serfdom in Russia in 1861. It associates with the dividing a part of land belongs to landlords, mostly German sources, among Latvian peasants after the necessary survey and assessments.

The second agrarian reform completely named the medieval mode of husbandry in the Latvian countryside and paved giving back the land to its actual owners and founding a safe economic basis for a newly independent state of Latvia. In the Course of this reform the land legislation system was established and developed crowning the laws of the land reform and corroborating with the
laws on Cadastre and Land Register, as well as the Civil Law, progressive in Europe that time. Towards the end of 1980s one third of the territory of Latvia was covered by a modern Cadastre based on the results of an exact survey and assessment of the real estate.

The third agricultural reform began in late 1940s with a violent transfer to collective farming, and the land was taken off its owners. Thus, the achievements of the first two reforms were completely annihilated.

One of the first tasks the government after regaining the independence was to re-establish private property as one of the main economic and political conditions, and as far as possible to restore the justice in respect to the former owners and their heirs. However, along with the obvious success of the fourth land reform its implementation is also facing serious obstacles. I think that these problems mostly are the same in any country in transition.

The main goal of the present reform is to establish an up-to-date system for managing of land and immovable basing on the safety of private property guarantied by the government.

The administrative system is assmpted to be acceptable if it:
- guarantees property rights;
- provides for taxing of the land and immovable;
- provides guarantees for credits;
- develops and monitors the market of the land and the real estate;
- takes care of the state land estate;
- exclude controversies;
- facilitates the land reform;
- promotes urban planning and development of infrastructure;
- provides for environmental protection;
- processes the statistics.

Characteristics of the Present Land Reform

Supply of the land and real estate for private and social sector is an important part of the transition process for Central and Eastern European countries. The structural changes in property relations will essentially influence the private initiative and the economic and social welfare of the countries interested in it.

Successful transformation of property relations is determined by completeness of land reform. Achievements depend on the historical experience, legislation and the technical possibilities for land reform.

Latvia is in transition from command economics, where land administration was built on simplified bases and people operated mainly with big land areas, to market oriented economy, where dominating land property size is relatively small.

The period of transition is characterized by very variable and multipurpose land use and property structure. At the same time there are land for use, property, small lands, state owning, buildings which exist as independent properties, etc., and the boundaries are subject to continuous changes. And all the above mentioned has become more complicated due to unorganized legislative system, especially it regards to land physical situation - land cadastre and valuation of the real estate and taxation (see pág. 67).

The first half of 1990s across the Central and Eastern Europe was the period of serious structural reforms in agriculture and related services, agriculture production and trade. All the Central and Eastern European countries had several similar features:
- the decrease in agricultural production for 40-50%, comparing with end of the 1980s;
- essential decrease of agricultural percentage in the GDP;
- rapid increase of prices for the resources used in agriculture (fuel, technique, fertilizers, pesticides, etc.);
- huge structural and property relation changes did not give quick favorable result.

Comparing with other Central and Eastern European Countries, Latvia is one of the agricultural structure established in the past:
- Latvia was undergoing the most serious changes not only in the land property but also in land use field;
- in Latvia farmers and other private enterprises which mainly depend on family and few seasonal employees create the main part of the land users and production amount as it is similar in other countries in transition;
- privatization and restructuring has occurred very rapidly.

We can see that in Latvia:
- big collective administrative enterprises in agriculture has no important role, except few cases when they will be able to create competition for farmers;
- a different basis for productions technologies, motivation and lifestyle in rural region has been established;
- employment for all the employees involved in agriculture before the reforms will not be possible only in agriculture.

The land privatization process is indicated by following figures:
- during the period of more than 2 years starting with June, 1993, which are first records where made in land books, until January, 1996 in the land books there are registered 37,699 land properties with the total area of 506,828 ha.
- 63% of agricultural land is managed by private sector, and this data is one of the biggest in the Central and Eastern Europe.
- the land buying agreements up to 1 January, 1996 have signed 23,720 persons for the total area of 167,914 ha.

Neglecting the economic difficulties the properly registered land property has a high prestige. Basties are giving credits and accepting different other transactions for such deposits. Foreign business partners are reckoning it a value, as it is shown by the number of applications for registration of property submitted to the State Land Service. Unfortunately shortage of the budget means does not allow to carry out the necessary free service to the owners, but owners are usually in need (see pág. 69).

As regards the situation in Latvia we can say that the beginning phase of the reform has been carried out and fulfilled except few small district towns, where the reform is delayed. The second part of the land reform is decided to be invested of the undistributed land, the acquiring program preparation for it and realization.

At this moment the laws which are in force determine that the land in Latvia can be owned by state, local authorities, Latvian citizens, juridical persons registered in Latvia, in which citizens of Latvia own more than 50% of the capital, as well as the enterprises of the counties which have signed the agreement on investment promotion and defense.

For acceleration of the land reforms speed in Latvia there are several obstacles, such as:
- lack of financial means;
- complexity of the process;
- legal difficulties;
- technological needs;
- organizational inefficency.

Cadastre System Establishing in the Republic of Latvia

Until year 1940 the well done system of real estate and registration established order and stability in the social and economical life in the country. Strong legislation base secured the right property relations. During the Soviet period all that was completely vanished and cadastral valuation was ignored.

In 1994 the Land Cadastre Center prepared the strategy 'Establishing of Land Cadastre System in the Republic of Latvia'. In order to found the mentioned system the strategy foresees 4 preconditions:
- arranged legislation base;
- strengthened organisational structure;
- the project for technical realization of the system;
- guaranteed financial support.

It is assumed that the system can be implemented in the period of 5-7 years. Practical implementation of cadastral register and cadastral map in all registries has already started, according specific methods the cadastral valuation is carried out. Following the project of technical realization the computerization of all the above mentioned work in the country has started.

Cadastral Valuation and Taxes Based on Real Estate Value

The legislation distinguishes two kinds of valuation: the valuation of land and that of buildings. The valuation of the land is different in rural areas and in cities. The value of the rural land is determined by the principle of potential income using two criteria: potential productivity of the soil and location of the land parcel. For the cities, the simulated market value is determined according to the location of the land parcel, land use purpose and the level of physical development. For the determination of the value for the buildings, the calculation of construction expenses, including materials and wages, is used.

All the above mentioned valuation methods in some way are based on Soviet time economy. Real property market in Latvia is only forming now. Thus, determination of the level of the market value is too complex. Especially great differences can be observed between cadastral values and market values for buildings.

To improve the situation it is necessary to order legislation by the determination of the unified principles for the valuation in the whole real property as well as
the components of the property. Also it is necessary to form the information basis to support valuation.

During this year close links between cadastral and market values should be reached. It is abnormal that in some cases the value differs for 200-500%. The problems arise from unsigned and confusion in the real estate market.

As you have already understood there is no real estate valuation in Latvia in complete meaning of the word. There is no law which regulates the valuation of the real estate. At the same time there is law «On Land Tax» which determines the size of the Land Tax: tax payer, which are physical and juridical persons; and who have land for use or property. Physical and juridical persons for agricultural activities are paying only one tax. The area which is supplied to physical and juridical person by state or local authorities as a land for use or property is determined as taxation object. But there are exceptions like land under traffic roads, communications, educational, sport institutions, etc.

The tax in rural areas is determined according the value of the arable land is points and the location according the specific average rate. As the base for the average land tax rate (local currency unit per 1 ha) is used rural area average values. How are they settled?

For valuation of the rural area the land is divided in three groups:
- residential parcels;
- summer house land;
- farmland.

Each of them have specific valuation methods. Up to now the most requested valuation has been for the farmland group. The parcel value of this group is determined according the regulations which are in force and there are two main principles:
- the potential productivity of soil;
- the location of the parcel.

According these principles until 2 January, 1996 were evaluated 25 000 farmland parcels as well as similar agricultural parcels. By statistical calculation the average values per 1 ha in parish as well as in district and whole country has been settled. The mentioned average value per 1 ha consists of the weighted average sum of the arable, forestry and other land use specific values (see pág. 71).

By analyzing the dynamics of the average values, we can see that in case of small number of observations the value differ very much, but starting with 50 observations, the value have a tendency to get stabilized. If the number of observations exceeds 100 the value differs in margins of 2-5%.

Taking into account the unequal demand for valuation in different parishes, the average land value can be different while the number of observations increases. However, the main tendencies can be forecasted. The most valuable land is in the parishes close to the capital city - Riga. But the least valuable land parcels are in a distance from cities and big towns as well as from the main traffic roads.

In urban areas the tax rate (local currency unit per m²) determined by specific list of city and town priority. The same is with the parcels for summer houses and personal construction needs, etc. In this case there is a special list as an annex to the general law.

The law provides few discounts for tax payers. Local authorities have rights to diminish or release from payment tax payers for a certain period of time (crippled people, religion organizations, newcomers in agriculture, etc.)

The calculation and payment order of the tax is included in the same law, as well as the punishment for not following the regulations.

It is settled that the tax payment and calculation order is set by the local authorities according the situation on 1 January and announce until 1 March the sum of the tax and the term of payment. The whole sum of the tax goes for the budget of local authority.

The cadastral valuation data is used for:
- tax calculation of the real estate;
- calculation of the state land rent;
- buying out price of the land;
- land buying, selling, inheriting, granting, etc.
- procedures;

A present the average cadastral price for rural area land in Latvia is 310 USD per ha (maximum 355, maximum 1500%). In the capital - Riga the minimum price is 2.22 USD per m², at the same time for commercial use in the city center the price is 1422 USD per m², and for individual building the price is maximum 105 USD per m². But it is the market price. Let us say that the cadastral value dictates the market price as the market of the real estate has not settled yet. At the same time the specialists of the Cadastre Center have begun the examination and gathering of market prices, in order to make editing in cadastral valuation methods.

Conclusion

Our citizens are interested in completion of the land property legislation and the right evaluation of land taxes as soon as possible, but cadastral services should always keep in mind that the quality and safety of this property must be maintained. Decrease or even loss of prestige of the properly registered and evaluated property should never be allowed, and the establishment of the system of cadastre can only provide this prestige.

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The cadastre in Bulgaria: its state and future

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Bulgaria's territory is 111 thousand sq. km with 58% of them being agricultural land, and 70% of the latter being arable land. The country is divided administratively into 979 municipalities. The population of the country (8.5 M) inhabits more than 5 thousand settlements occupying 3.6% of the country's territory.

Working out the first cadastral plans started in 1881 for city planning purposes. This took place only three years after the end of the Russian-Turkish War (1877-1878) which partly liberated the nation from the Turks.

The Cadastre in Bulgaria is designed to capture, process, store and make available immovable property data for settlements, farm land and forestry, i.e. for the whole territory of the country.

As a nation-wide activity for providing the basic immovable property information, the Cadastre lies at the foundations of: Taxation, Legal security of immovable property ownership, Regional planning, Environment, etc.

The cadastre is envisaged to be developed as a unified system putting all cadastral activities in settlements, farm land, forestry, etc. throughout the territory of the country upon a common methodology and under a common supervision and control. The cadastre shall be funded by the central budget.

All services carried out by the cadastral offices, shall be paid by customers, including the cadastral information. In some cases, a preferential or free of charge use of cadastral information shall be provided. All fees shall be remitted to the central budget or to a specialized Cadastre Fund. Thereby the cadastral shall secure its partial self-support tended towards gradually
achieving full support. The return of the cadastral shall be open in their form however supplemented by hidden results due to the contribution of cadasters to:

(I) Taxation which shall be provided with precise data on size and assessment of land as well as on land owners;

(II) The judicial system including real estate registration which will be supplied with data on location, neighbors, size and other data of estates;

(III) Regional planning, agriculture, ecology, etc.

Based on cadastral data which shall be the basic and most necessary data on immovable properties, institutions and local authorities may establish specialized information systems by adding specific data. In time, with the accumulation of sufficient pool of information and through providing the necessary technical conditions, a large scale geographic information can be set up.

In terms of organisation, the basic units of the cadastral system are envisaged to carry on evolving as government cadastral offices. Privatizing them is not expected.

Cadastral legislation

Political and mainly military events foiled the implementation of two cadastral laws in 1800 and 1908. Another important reason for this mismanagement is the insufficiency both of funds and of well-trained specialists in the young Bulgarian state.

In 1941, the Law of Cadastre and Land Consolidation came into force and started being implemented. It covered predominantly farming land. Based on it, cadastral plans under 1:2000 scale were prepared for some of this land within several years. The Law was revised in 1951. In 1979, the Law of the Unified Cadastre of the Republic of Bulgaria was enforced. In the process of its implementation, together with a number of positive characteristics, the maximality of data volume requirements appeared to be a fault. As another flaw, a certain commitment to the old social system can clearly be seen now. For reasons well-known, the existing legislation cannot meet the new demands, and therefore the draft for a new Law of Cadastre and Immovable Property Registration is currently in the process of elaboration.

Current organizational structure of cadastrae

Corresponding to the current legislation the organizational structure now comprises managerial and production units.

Managerial Units

The Main Department of Cadastre and Geodesy at the Ministry of Regional Development and Construction.

Regional offices of cadastral, survey and immovable property registration. These are 28 local administrative divisions of the which are situated in the bigger cities and thus are evenly distributed throughout the territory of the country.

Production Units

Territorial cadastral companies - 27 in number, located in the same cities where the regional offices of cadastral, survey and immovable property registration are.

The companies were created in the early 1980s to implement the Law of the Unified Cadastre of 1979. They are equipped with devices for survey activities, digitisers, computers and software. The latter two however have not the necessary capacity to process the amount of information needed.

The National Centre of Cadastre in Sofia. Apart from the equipment shared throughout the territorial cadastral companies, the National Centre of Cadastre also has photogrammetric equipment.

Sofio Regional Company. The company carries out the cadastral and the survey activities, as well as the major bulk of technical services on the territory of the Sofia big municipality.

Current condition of the urban cadastral

The settlements have been the most active areas of cadastral in its history so far. Since the end of the last century, cadastral maps have been produced for them, which, in accordance with former attitudes have had a topographic format. They contain basic physical characteristics and other data on immovable properties referring to boundaries, fences, type and construction of buildings, type of permanent use, infrastructural elements, relief of the terrain, etc. In the cadastral maps, immovable properties are numbered and registered (inventory law) are kept in accordance with this numbering. In most registers every property figures with its owner's name, ownership documents and other data.

It has been common practice so far to use the cadastral maps of settlements mainly as a basis for detailed city planning and construction, as well for conveyance of property rights under a parochial registration system.

All settlements in Bulgaria (roughly 5000) have cadastral maps and immovable property registers. They are kept at the territorial cadastral companies (27 in number) or at the Municipal Technical Services. The latter make cadastral maps and data available to customers in the process of implementing the settlement plans. A serious disadvantage of the settlements' cadastral maps is their becoming outdated for lack of systematic updating procedures.

The great information potential of the cadastral maps cannot be utilized to its full capacity because of the restrictions mainly due to their original graphic format. The transition to digitized data and thereby creating a new cadastral information system is a forthcoming task. In order to utilize the existing cadastral maps prior to digitizing, it is necessary to update them through surveying and supplementing the missing elements as well as through finding all changes in ownership. When it should prove impossible for the great amount of changes which would inevitable encompass the original with too many alterations and supplements, new cadastral maps should be prepared.

On the national scale, it is a task of great technical and financial volume which can only be solved in separate stages. The activities of maintaining and updating the cadastral maps and data shall be carried out simultaneously.

Current state of the rural cadastral

The outlook of Bulgarian farm land is now in the process of profound change as a result of implementing the Law of Agricultural Land Ownership and Land Use (Land Law). The large co-operative land massifs of uncertain ownership are being fragmented into numerous private lots. This brings about through alterations in existing cadastral materials and data on farm land which are now providing basic information to land allocation.

Certain part of Bulgarian farm land has already been given back to legal owner or their heirs in the order of the Land Law, its Implementation Regulations or other by- or sub-laws. As a result of the concluding restitution procedures the basic land estate data (border point co-ordinates, ownership data, plot size, soil category, etc.) are being produced and need to be adopted by the cadastral. These data are on technical carriers suited for automatic processing. They are the initial data for a farm land cadastral. It is expected that right after the process of land restoration is completed, different kind of conveyances (partition between heirs, sales, etc.) will take place and will lead to dramatic changes in land geometry, ownership, etc. These changes have to be surveyed and recorded by the cadastral upon the initial basic data, i.e. the cadastral farm land data ought to be constantly kept up-to-date.

A system for registration of immovable properties

In Bulgaria, a personal system for ensuring titular deeds is being implemented based on the Property Law. Adopting the proper legislation and introducing a real system of land registration is pending.

A project for a new organizational structure of the cadastral in Bulgaria

The Need of a New Structure

The changes which occurred in the country call for the revision and restructuring of the cadastral organization.

According to the Constitution of the Republic of Bulgaria «the right of ownership and inheriting is guaranteed and protected by the law». The state should create a relevant system of guarantees to implement this constitutional provision. Since the cadastral documents immovable properties by their location, borders, size and ownership, it constitutes the cornerstone of such a system, upon which the other basic element - the immovable property register (the land register) shall be established. The government is therefore liable to provide for the cadastral in terms of funding and management, and thus make it a permanently functioning centralized government structure with a system of locally operating units which may also enlist the services of private survey companies.

Twenty seven cadastral offices shall be established in 27 bigger cities as budget-funded divisions, and the National Center of Cadastre in Sofia based on the existing structural units the major part of which are public companies (the Ministry of Regional Development and Construction).
Cadastral Offices

Functions of the Cadastral Offices

The cadastral offices shall be designed to capture, process, and store cadastral data and documentation in order to establish the data base and the information system of cadastral. The cadastral offices and their bureaux shall issue excerpts of cadastral maps and provide services based on the cadastral data and shall provide the survey needed in immovable property transactions. They shall also cooperate with the registration offices (the notaries) over such transactions. Based on the documents created in the process of this cooperation as well as on survey carried out, the cadastral offices shall maintain the updated cadastral information on immovable estate, in cases when initial cadastral data ought to be collected, surveyed, and other supplementary work shall be assigned to specialized survey companies and licensed individuals and shall be controlled and approved by the cadastral offices.

Number of Cadastral Offices

The cadastral offices chosen were relatively small in number in order to:

- Govern and control them effectively from the center;
- Gradually equip them with the best possible (from financial and technical point of view) and sufficient powerful computer systems to process and store cadastral information, with devices to communicate with notary offices and consumers, with modern survey, digitizing and automatic drawing equipment, with transport vehicles, etc.;
- Achieve the best possible personnel structure per office so that it may function at minimal administration cost (including its technical control);
- Accelerate the build-up of their system in view of the already permanent distribution of surveyors following the long-standing tendency in the migration process which led to critical shortage of surveyors in the smaller cities;
- Evenly cover the territory of the county to a sufficient extent.

Bureau of the Cadastral Offices

The bureau serves as a computer center to consumers of cadastral information and reduces costs. Cadastral offices shall establish their bureaux in cases with regional courts and the respective cadastral activities. In terms of service functions the bureau shall be equivalent to the cadastral offices. The cadastral offices and the bureau shall be located in towns in equal (27 offices and 6 bureaux)

Basis for the Establishment of the Cadastral Offices

The now existing regional offices of cadastre, survey and registration of immovable properties and the public cadastral companies shall serve as a basis for the establishment of the cadastral offices and the National Center of Cadastre. This will lead to the employment of already harmonized and experienced teams and the use of already available equipment.

Financing the Cadastral Offices

The newly established divisions as described above shall be financed by the central budget. They are not meant to be privatized.

Apart from inheriting the property of the old production companies, the cadastral offices shall need to be gradually re-equipped with up-graded computer systems and with other kind of equipment. To this end, additional budget funding shall be needed.

It should also be taken into consideration that the cadastral offices and the National Center of Cadastre shall provide all the services (inquiries, issuance of drafts, survey, etc.) on reasonable fees, constituting the cost together with a share of the initial information price, that is, they shall at least partly recover the budget funds previously spent (through a special Cadastre Fund).

Functions of the Budget Units

Management of the Cadastre

The cadastre shall be managed by the Ministry of Regional Development and Construction through its Main Department of Cadastre and Geodesy. The Department shall secure the proper conditions for running the cadastre nation-wide, and for setting up and maintaining its information system. In the field of cadastral, the Main Department of Cadastre and Geodesy shall:

- Prepare drafts for laws and sub-laws;
- Work out long-term and annual programmes and substantiate the required government budget funding;
- Allocate funds over individual tasks in accordance with annual programmes as approved;
- Suggest the structure and supervise the activities of the cadastral units;
- Organize expert activities;
- Promote the reception of foreign aid and its proper allocation and spending;
- Coordinate the input of foreign companies carrying out cadastral work in the country;
- Provide consultations to other organizations and to local authorities;
- Set up the fashion in which cadastral materials and data are accumulated, processed, stored, multiplied and circulated.

The Cadastral Offices shall:

- Control and accept the contracted out cadastral works, control and participate in the acceptance of all kinds of survey works assigned by public or municipal bodies;
- Keep in stock and secure the use of cadastral maps originals in digital, graphic and written form except those stored only at the National Center of Cadastre;
- Based on the documentation in (B) hereof, establish the database and the information system of the cadastral in their area by integrating the cadastral data for settlements, farming land and forestry into a common database;
- Maintain bilateral information exchanges with registration offices (notary offices) over immovable property ownership changes;
- Provide cadastral data to be used, issue cadastral maps, carry out inquiries and other technical services connected with proving or change of immovable property rights, while executing the necessary survey;
- Keep up-to-date the data-base and the information system in their area;
- Control the preservation of survey marks;
- Run information exchanges with local authorities over developments of importance for the cadastre, and assist local authorities with consultations;
- Process data of annual land accounts and balances in their area for the needs of local administration.

The National Center of Cadastre shall:

- Accept from the cadastral offices and keep in timely-to-use form the cadastral data as of the previous year end;
- Provide information of the state borders, the administrative unit borders and the borders of the territories belonging to settlements;
- Create and process cadastral data under generalized indicators and characteristics, create and maintain the data-base and the information system of the national cadastral and provide data from it, as well as prepare balances for government needs;
- Provide technical services and advice to the cadastral offices;
- Summarizes the data of the annual land accounts and the balances of the national territory for government needs;
- Prepare draft laws and sub-laws, and issue regulations in cadastre, as well as carry out development activities;
- Maintain a national fund to accept, store and submit to users geodetic, aerial photography, mapping, cadastral and other materials and data of national importance.}


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