Building Land Information Policies in El Salvador

Felix Garrid SAFIE, El Salvador

Key words:

ABSTRACT

El Salvador, with a total area of 20,740km² and 6.9 million people, is the smallest and most populated country in Latin America. It is therefore critical to achieve an effective and concerted project for administering the land resource, which will allow reduce the always-latent source of social conflict.

Land administration commenced in 1932, when the Government of El Salvador started developing a Policy aimed at facilitating peasants' access to land by different programs.

In 1980, the Second Land Reform expropriated all Rural Land exceeding 245 hectares. In January 1992, the Peace Agreements launched an internal reconciliation and reconstruction process with a Land Transfer program to benefit demobilized soldiers from the Armed Forces and the Farabundo Marti National Liberation Front (FMLN).

The first land registry was created in the XIX century, following the security of tenure that was then in force in Spain. In 1976, the General Bureau of Records (*Dirección General de Registros*) was established. In 1986, in response to illegal settlements of land, the Law for Restructuring the Land Property Registry (*Registro de la Propiedad Raíz e Hipoteca*) was passed. The aim of the law was to provide registration and publicity to landowners' interests and tenure as well as to land transactions.

Cadastral activities were started by end 1963 but the National Cadastre was created only in 1970. In 1974, a Legislative Decree prescribed that the cadastre implementation was of public interest.

Legislative Decree 462 of 1995 confirmed that the National Registy Center (CNR) is a public institution with administrative and financial autonomy. This Decree merged the General Bureau of Registries (*Dirección General de Registros*), the Land Property and Mortgages Registry (*Registro de la Propiedad Raíz e Hipotecas*), the Social Registry of Real Estate (*Registro Social de Inmuebles*), the National Geographic Institute (*Instituto Geográfico Nacional*), the Registry of Commerce (*Registro de Comercio*) and the National Cadastre (*Catastro Nacional*) and thus consolidated all land registration and information functions in one single institution.

The modernization process led the CNR to coordinate with other institutions, either directly or indirectly: sectorial government bodies, National Plan for Land Administration and

Development, autonomous institutions, Cultural Assets Inventory, organizations providing technical assistance and Local Government structures: the *Alcaldía.*

There is a number of Geographic Information Systems (GIS) created for specific tasks. Lack of information about the existence of any information system results in duplication of efforts and higher costs.

The Land Information System's main objective is to integrate land information authorities and functions so as to overcome difficulties derived from scattered institutional efforts. The CNR should be responsible for maintaining one single technical platform, under the guidance of the National Cadastre and Institute.

Phase 1 of the Project: National Modernization Plan of the Land Registry and Cadastre involves the up dating of registration and cadastral functions. Also, the registration function is to be transformed by new technology, decentralization and institutional strengthening. 1.2 million land parcels were surveyed and incorporated into the registry/cadastre, that is, 60% of the country. Besides, 10 regional offices were modernized and linked using IT connectivity.

Phase 2 is being drafted to: a) provide ownership and formalize tenure of all lands within El Salvador, b) enhance land administration services at the local level and c) maximize inter-institution coordination and therefore, continuance of the project.

In El Salvador, tenure formalization involves different activities performed in several stages: input all legal information in paper (Registry books) to the alpha-numeric IT system of the SIRyC, survey legal and geometric data in the field and link them one by one, link field data to digitalized information in the Registry, provision of ownership and clearing of special cases.

The CNR is responsible for aerial photographs taken at a scale of 1:15,000 and covering all the country but at a scale of 1:5,000 in rural or densely populated areas. It is also responsible for the geodesic network and its densification. Basic mapping supports field surveying with orthophotographies at a scale of 1:5,000 all over the country and with photogrammetry rendering at a scale of 1:1,000 in urban areas.

Mapping and field information surveying (legal and geometric information) are outsourced as well as data processing until data are linked to one information layer. The CNR is responsible of quality control following ISO 2859.

At present, the CNR is developing Internet-based tools to provide users access to cadastral and registry data and to work in close relationship with local administrations.

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1. GEOGRAPHY.

- Area: 20,740 km^2
- Border Countries: Guatemala, Honduras
- Regions: Western, Central, Paracentral, Eastern
- Departments: 14
- Municipalities: 262
- Population: 6,9 million
- Population of the capital city, San Salvador: 2,1 million

El Salvador is the smallest and most populated country in Latin America. Overpopulation has always been a critical problem because the country has limited land resources. Many wars were fought to gain access to the land. The last war ended in 1992 and it derived from, among other reasons, the conflict between social, economic and political groups with opposing interests and with different access to wealth and political decision-making centers. It is, therefore, important to develop an effective, agreed-upon project for administering the land resource, which will allow reduce the always-latent source of social conflict.

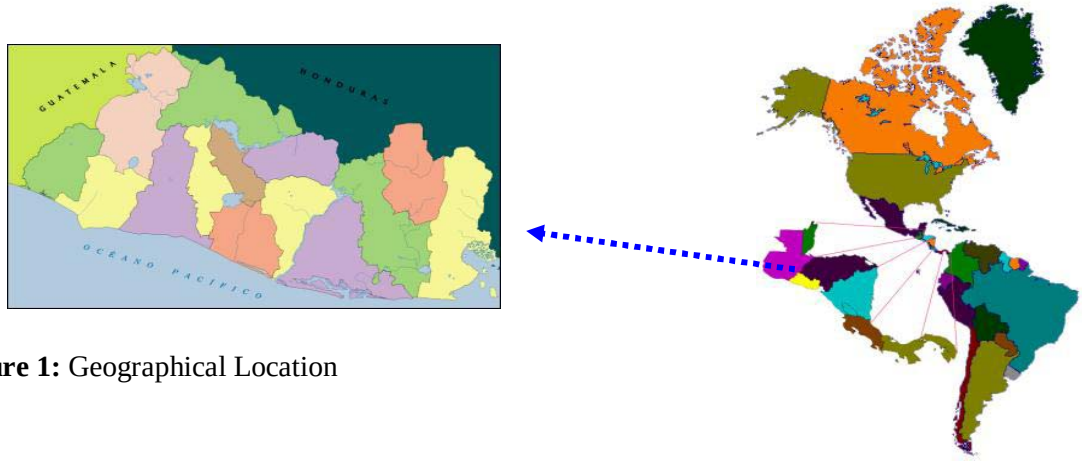

Figure 1: Geographical Location

2. HISTORICAL HIGHLIGHTS OF LAND ADMINISTRATION AND LAND REFORM

There have been several moments and stages in the evolution of Land Administration. Each of them features the enactment of Laws and/or Decrees, the establishment of and particular social groups becoming beneficiaries of the process.

Land administration commenced in 1932, when the Government of El Salvador started developing a policy aimed at facilitating peasants' access to land by different programs

implemented, until 1975, by the Salvadorean Institute for Land Transformation (*Instituto Salvadoreño de Transformación Agraria*, ISTA).

Another highlight commenced in 1980 when the Second Land Reform expropriated all Rural Land exceeding 245 hectares. This Second Land Reform affected 411,151 hectares, that is 20% of the country and 46% of productive land, which were transferred collectively or individually. This Reform benefited 831,750 people.

In January 1992, the Peace Agreements launched an internal reconciliation and reconstruction process. From 1992 to 1998, the Land Bank (*Banco de Tierras*) and ISTA implemented the Land Transfer Program (*Programa de Transferencia de Tierras*, PPT) to benefit demobilized soldiers from the Armed Forces (*Fuerza Armada de El Salvador*, FAES) and the Farabundo Martí National Liberation Front (*Frente Farabundo Martí para la Liberación Nacional*, FMLN) following the terms of the Peace Agreements.

3. LEGAL AND INSTITUTIONAL ARRANGEMENTS FOR LAND REGISTRATION AND LAND ADMINISTRATION.

In the XIX century the Civil Code enacted in 1860 created the first Registry (only for deeds registration) inspired in the security of tenure effective in Spain at that time. Along the first 40 years the Code underwent some amendments and adjustments, such as the so-called Parcel-Based Folio (*Folio Real*), the Personal Folio (*Folio Personal*), all written in the 1904 Civil Code.

In 1976, Legislative Decree 502 created the General Bureau of Records (*Dirección General de Registros*). It was meant to enhance the Department of Justice's performance on matters related to security of tenure and at monitoring and supervising the Land Property and Mortgages Registry (*Registro de la Propiedad Raíz e Hipoteca*, RPRH). The Parcel-Based Folio system is implemented again.

In 1986, in response to illegal settlements of land, the Law for Restructuring the RPHR was passed. The Registry becomes an independent body that provides registration and publicity to landowners' interests and tenure as well as to land transactions (purchases, sales, transfers, amendments or settlements).

Cadastral activities were started by late 1963 with the design of a Pilot Plan but the National Cadastre was created only in 1970 to provide accurate properties' location, determine properties lineal and area surveys, properties' nature, valuation and prospective use, nomenclature and other characteristics as well as to clear land titles (land rights or land ownership).

In 1974, a Legislative Decree prescribed that the cadastre implementation was of public interest.

Legislative Decree 462 of 1995 confirmed that the National Registry Center (*Centro Nacional de Registros*, CNR) is a public institution with administrative and financial

autonomy. This Decree merged the General Bureau of Registries (*Dirección General de Registros*), the Land Property and Mortgages Registry (*Registro de la Propiedad Raíz e Hipotecas*), the Social Registry of Real Estate (*Registro Social de Inmuebles*), the National Geographic Institute (*Instituto Geográfico Nacional*), the Registry of Commerce (*Registro de Comercio*) and the National Cadastre (*Catastro Nacional*) and thus consolidated all land registration and information functions in one single institution.

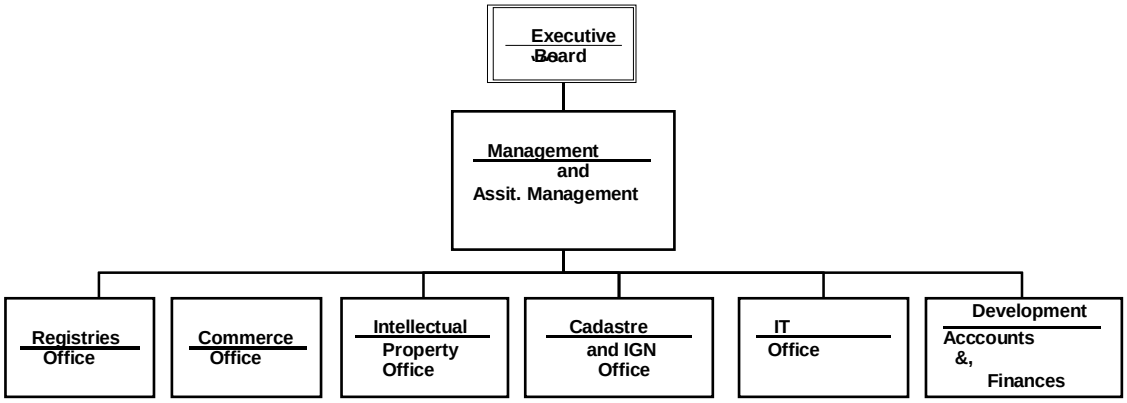

Figure 2: CNR's organizational chart (September, 2004)

The Computer Registries and Cadastre System (*Sistema Informático de Registros y Catastro*, SIRyC) derives from the National Modernization Plan of the Land Registry and Cadastre (*Plan Nacional de Modernization del Registro y Catastro*) formulated in 1995. This Plan fostered land security of tenure and was funded by the Government and the World Bank. The first cadastral and registry updating was targeted to be complete in 2005.

4. OTHER GOVERNMENT AGENCIES INVOLVED

The National Registry Center (CNR) is the institution responsible for properties' surveying, registering, mapping and computer management. CNR's organization is territorial so as to perform the following capacities:

- Land Property and Mortgages Registry, 10 offices,
- Social Registry of Real Estate, 3 offices,
- Cadastral Affairs in 11 department offices,
- Commercial Registry in 3 offices.

The CNR's modernization process involves six units that are linked to the Land Property and Mortgages Registry and are responsible for processing and examining documents from different government agencies, including:

- Social Housing Fund (*Fondo Social para la Vivienda*),
- Salvadorean Institute for Land Transformation (ISTA).
- Banking System.

These units internally coordinate the CNR with key government agencies. However, considering the sectorial and territorial arrangements of El Salvador, the CNR needs direct or indirect coordination with other government agencies because it is indispensable for those government agencies to perform their public policy duties, even if such coordination is not legally required.

4.1 Sectorial Government Agencies

The CNR has to coordinate activities with sectorial government agencies such as: (a) Department of Public Works (MOP), (b) Sub-Department of Housing and Urban Development—coordination is required for public works permits and housing development permits—, (c) Department of the Environment and Natural Resources to protect the environment and protected areas, and (d) CONCULTURA, to protect the national culture, archaeological and paleontological heritage.

4.2 National Plan for Land Administration and Development

The National Plan for Land Administration and Development resulted from a large study carried out by the Department of the Environment and Natural Resources, the Department of Public Works and the Sub-Department of Housing and Urban Development.

4.3 Nondepartmental Public Bodies

They include, for example, water utilities (ANDA) or power utilities (CEL).

4.4 Inventory of Cultural Real Estate

CONCULTURA has surveyed cultural real estate to facilitate coordination activities with the CNR to preserve the cultural, real estate, archeological and paleontological heritage of the country.

4.5 Technical Support Organizations

The General Bureau of Statistics and Census (*Dirección General de Estadística y Censos,* DIGESTYC) plays a key role in the production of demographic and statistical data production, indispensable information for the CNR's decision-making process and also for measuring the social impact of projects.

4.6 Local Government

The *Alcaldias* (Local Authorities) are one of the key, most important partners CNR may have. These local authorities are responsible for the political and administrative government of each municipality.

The survey function and the cadastral systems updating at municipal level are crucial for sectorial Government organizations and nondepartmental public bodies that provide services such as the water utilities.

5. LAND INFORMATION NATIONAL SYSTEM (SNIT)

5.1 Present Situation

Besides all the systems, agencies and organizations mentioned in the previous paragraphs, there is a number of Geographic Information Systems (GIS) created for specific tasks and developed by International Cooperation Programs, NGO's and private companies which nature, content or owners are not generally known.

Lack of information about the existence of any information system results in duplication of efforts and higher costs.

Furthermore, the lack of standards and procedures applicable to data and tools in use interferes with the development of joint applications and makes compatibility of information from different sources—both graphic or alphanumeric—either impossible or extremely expensive.

5.2 Evolution towards a Single Structure:

In view of the current situation, there is need to move towards a single structure that may solve current management, access and compatibility issues. This structure should allow:

- A common geospatial database that will reduce all efforts to develop applications by the users because data, tools and guidelines will follow standards.
- Reduce investments associated with core geospatial data production and maintenance by sharing costs and avoiding any duplication of efforts.
- Provide ample access to geospatial data at the lesser possible cost to favor using updated and validated information.
- Facilitating decision-making based on reliable and accurate information.
- Providing private organizations and users updated information for them to plan and implement appropriate policies and programs to respond to the challenges in their territory.
- Reducing the pressure on information producer organizations by providing users with easy and direct access to data.
- Enhancing coordination among information producer organizations to avoid duplication of efforts and to take advantage of synergies.

To achieve a single structure, the following requirements apply:

- A *better technical and institutional background*: Integrating all computer systems into one single network also demands efforts—through the application of internationally accepted rules—to harmonize the different criteria, systems and software used by

organizations so that data input into this new IT system are easy to access and import and do not require expensive future arrangements for their sharing.

- A political decision that affects several Departments of Government. This implies restructuring jurisdictions to concentrate these types of functions in the relevant agency and to avoid legal voids.

5.3 Objectives

The SNIT's main objective is to integrate land information authorities and functions related to land administration matters so as to overcome difficulties derived from scattered institutional efforts in a context of land, mapping and statistical deficit of data.

Territory—that is, a social and territorial system—is the most complex and significant resource the country has to advance towards development. The appropriate management of this resource requires a more updated, detailed and reliable level of information that the currently available.

Information is a high-ranking asset for public and public management. Modern data collection and management may be achieved under relative economic equilibrium, following operational modalities that are proper to private companies.

5.4 SNIT's Specific Objectives may be Achieved by

- Ensuring coordination among information producing public and private organizations to avoid any duplication of efforts and to take advantage from synergies derived from the joint work performed by multidisciplinary teams.
- Guaranteeing the compatibility and quality of any mapping and alphanumeric information through quality assurance procedures and criteria standardization.
- Providing public and private organizations with mapping and statistical information that is updated, technically validated and applicable in their decision-making processes and in their programs and projects formulation.
- Facilitating data access to citizens and, especially, to companies and institutions for the performance of their tasks and functions.
- Allowing to set up mechanisms for the SNIT and other data producing organizations and entities to agree on concerted actions.
- Reducing investment needs on equipment and on information (satellite images) that may be used by all SNIT members.

The CNR should be responsible for maintaining one single technical platform, under the guidance of the National Cadastre and Institute.

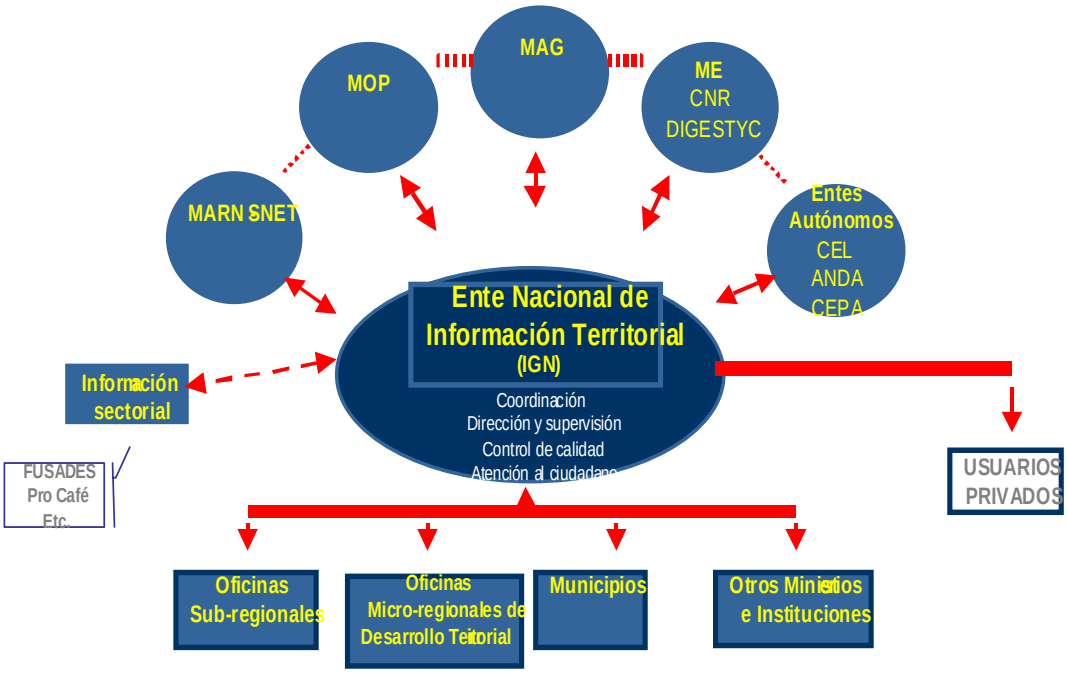

Figure 3: Land Information System

6. LAND ADMINISTRATION INITIATIVE IN EL SALVADOR

6.1 Phase 1 of the National Modernization Plan for the Land Registry and Cadastre, Funded by the World Bank, Involves the Following Tasks:

- Cadastral and Registry updating. The CNR with its own resources and through contractors performs data surveying tasks (Cadastral and Registration Data Record Cards and digital mapping).
- Correct properties location so as to provide their lineal and area measurements, determine landowners and owners of land rights, so as to accurately identify every property in the country by integrating the Registry and the Cadastre.
- Transforming the registration function through new technologies, a decentralization process and institutional strengthening

6.2 Results Achieved in Phase 1 (90% of Project Complete so far)

- Surveyed urban parcels that were linked to the cadastre-registry: 841,537 showing a density of 2,090 parcels/km^2
- Surveyed rural parcels that were linked to the cadastre-registry: 362,092 showing a density of 62 parcels/km^2
- 1.8 million parcels are estimated to exist in the country, therefore, 60% of the task is complete.
- Offices that were modernized and linked to the IT network: 10 departments.

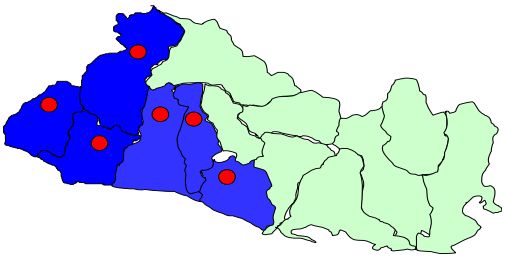

Fig. 4: Departments covered by the Cadastral – Registry surveying.

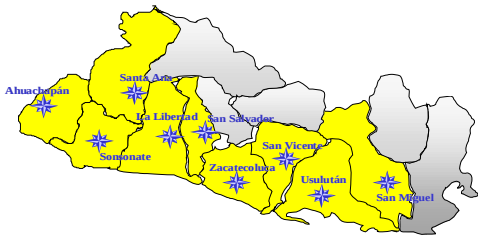

Fig. 5: Departments that were modernized and linked to the IT network.

6.3 Phase 2: It is Being Developed and Scheduled to Start in 2005

6.3.1 Component 1: Land tenure formalization

This component will complete the formalization process and will provide ownership to all lands in El Salvador. Formalization in this context means the systematic surveying of cadastral maps based on parcels, the provision of legal land titles (through conflict solving processes, where necessary) and land registration.

- Reviewing the legal framework: This sub-component will develop all necessary legal instruments to formalize every land tenure arrangement existing in El Salvador.

- Activities related to land tenure formalization: This sub-component includes geodesic and mapping tasks, field surveying and better integration of ground-based data into parcels in the National Land Registry and Cadastre.

- Set boundaries and consolidate Protected Areas: This sub-component involves tasks aimed at formalizing tenure of lands within protected areas in El Salvador.

- Institutional Strengthening: This sub-component will support government agencies responsible for formalizing land ownership and land titles across the country, especially agencies at national level that provide land titles to rural and urban land that were not included in Phase 1.

6.3.2 Component 2: Land Administration Services

This component is aimed at enhancing services related to land administration at local level. It will provide for equal and accessible land services and for a more effective maintenance of the parcel-based registry across the country.

- Land Administration Services provided by the CNR: This sub-component will strengthen CNR's capacities for the provision of local services, including sales, inheritance, mortgages and registration.

- Land Administration Municipal Services: This sub-component will strengthen local authorities' capacities to provide cadastral information maintenance and management services. This a key sub-component since the municipalities are key partners for the CNR to continue maintaining the parcel-based land registry.

6.3.3 Component 3: Project Management

Since the project involves several organizations and partners, it will be necessary to focus on project management to maximize inter-institutional coordination and therefore, continued project implementation.

6.4 Projects Technical Activities

In El Salvador, tenure formalization involves different activities performed in several stages:

- Input all legal information in paper (Registry books) to the alphanumeric system of the SIRyC).
- Survey legal and geometric data in the field and link them one by one with other data.
- Link field data to digitalized information in the Registry.
- Ownership and clearing of special cases.

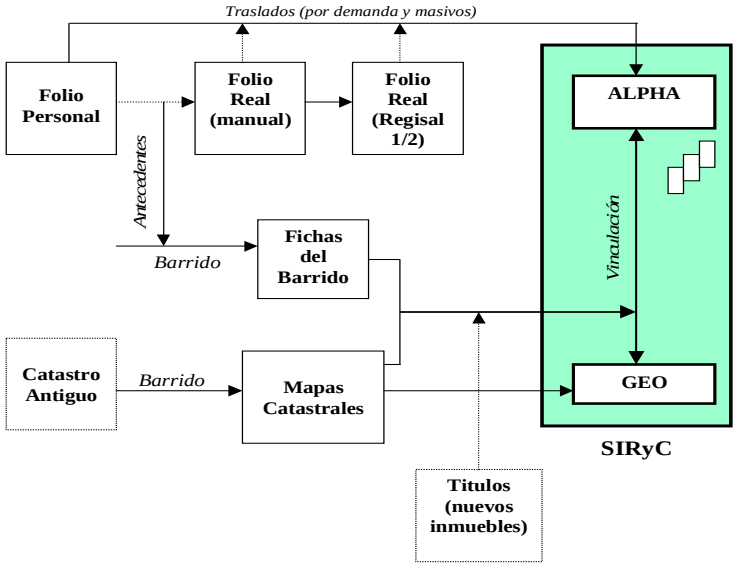

Figure 6: Clearing Flowchart

Traslados (por demanda y masivos)	Transfers (on demand and massive)
Folio personal	Personal Folio
Folio real (manual)	Parcel-Based Folio (manually recorded)
Folio real (registral ½)	Parcel-Based Folio (registry-based, ½)
Antecedentes	Background
Barrido	Surveying
Fichas del barrido	Surveying Record Cards

Catastro antiguo	Old Cadastre
mapas catastrales	Cadastral Maps
vinculación	Linkage
catastro nuevo	New Cadastre

The CNR is responsible for taking aerial photographs from a Cessna plane equipped with a RC30 camera and a GPS. Photographs are taken at a scale of 1:15,000 across the country and at a scale of 1:5,000 on urban or densely populated areas.

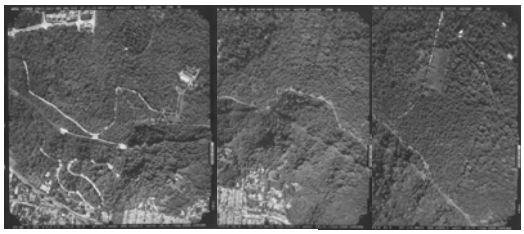

Fig. 7: Aerial photographs in layers

Fig. 8: Cessna Plane

The CNR is responsible for the geodesic network and densification. There are 17 high precision points in the ITRF 97 system and a COR's fixed station. Densification is performed in approximately 40 points in every department.

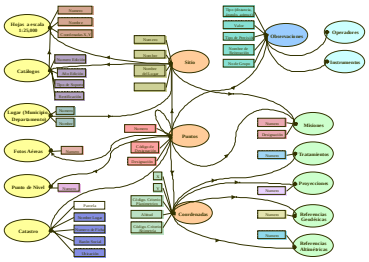

Fig. 9: Geodesic Base Model

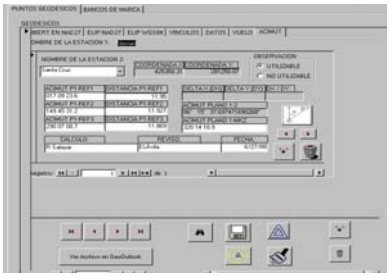

Fig. 10: Geodesic Base

The CNR is responsible for delivering available databases: books with all scanned registers across the country and partly input to the SIRyC. On the other hand, digital historical cadastral folios are available.

Topographic mapping and field surveying (geometric and legal data) are outsourced through international bidding processes, as is data processing until data are linked to one information layer. Without consideration to technical or management capacities, municipalities are divided into urban and rural sectors. Each sector has boundaries taken from topographic details and should not separate parcels. In urban areas, sectors are about 0.2 km^2 but in rural areas, about $8km^2$.

Fig. 11: Geometric and Legal Data Surveying

Fig. 12: Cadastre – Registry Integration

Basic mapping supports field surveying. Basic mapping are black and white orthophotographs at a scale of 1:5,000 across the country with photogrammetric renderings at a scale of 1:1,000 in urban, densely populated areas.

Fig. 13: Photogrammetric rendering

Fig. 14: Orthophotograph

The CNR is responsible for quality assurance processes. The great number of data surveyed and processed by companies was a challenge that required the development of specific quality assurance procedures using ISO 2859 and based on samples.

However, along the project it was evident that it is impossible to ensure product quality unless the company has its own quality control system. Therefore, a mixed system was implemented. This system allows CNR—via Intranet and almost in real time—to monitor the company is following a quality control that is acceptable for both parties.

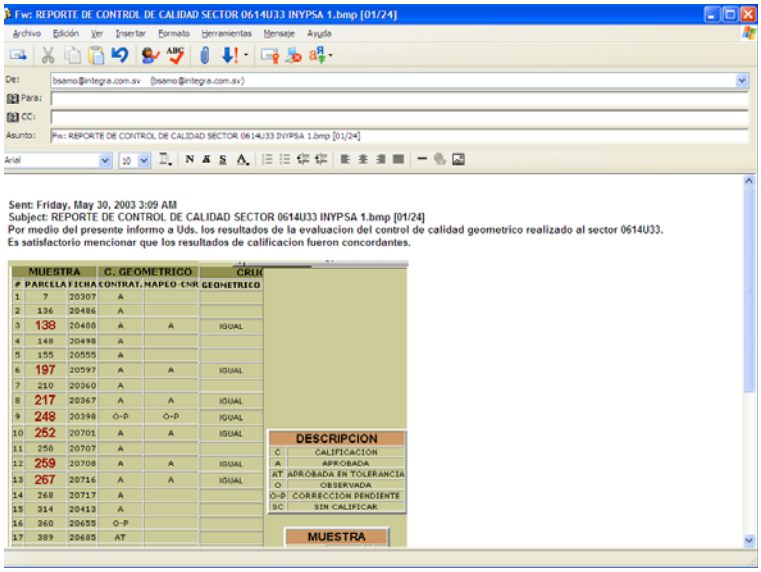

Fig. 15: Quality Control Monitoring via Intranet

6.5 Services Under Development

At present, the CNR is developing on-line tools to provide users the possibility to run cadastral and registry queries and to work in close contact with local authorities.

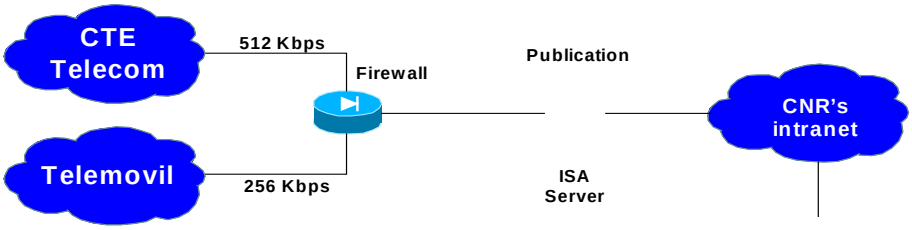

Fig. 16: Communication Flowchart

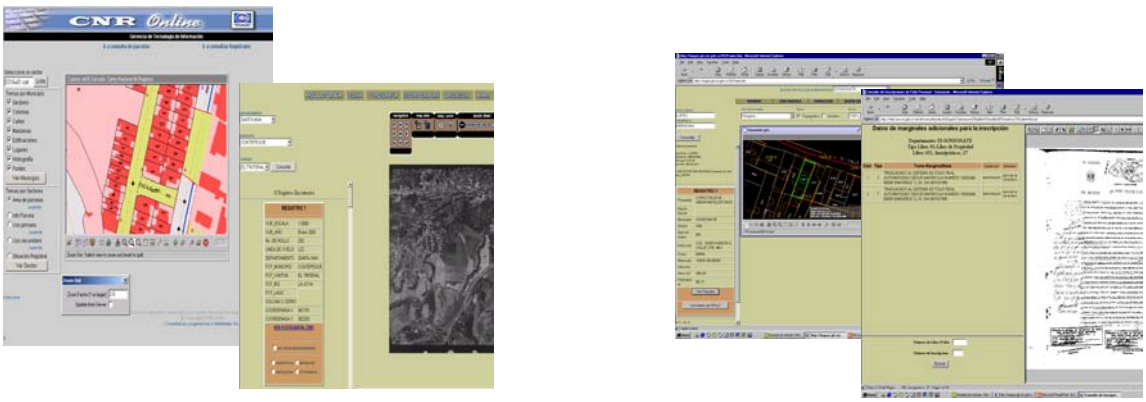

Fig. 17: Available Cadastral and Registry Data Sharing

CONTACTS

Felix Garrid Safie
Director Ejecutivo del Centro Nacional de Registros
1a. Calle Pte. Y 43 Avenida Norte #2310
San Salvador
EL SALVADOR
Email: gsafie@rsi.cnr.gob.sv