LAND INFORMATION SOURCES
IN LATIN AMERICA:
VOL. 1: INTRODUCTION AND
MEXICO AND CARIBBEAN COUNTRIES

By

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And other contributions as listed
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All views, interpretations, recommendations, and conclusions expressed in this paper are those of the authors and not necessarily those of the supporting or cooperating organizations.

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MEXICO LAND INFORMATION SUMMARY
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I. National Land Markets and Land Information Institutions:

A. Land Rights and Markets in Mexico

Mexico's social sector is comprised of both ejidos and agrarian communities, the latter referring specifically to a land tenure form designated for indigenous people. According to the 1991 Ejidal Census (INEGI, 1994), there are 29,983 ejidos and agrarian communities occupying over 103 million hectares, or roughly 52.4% of Mexico's surface area.

Alongside private property owners with fee simple rights, the ejido sector represents the most important player in the Mexican land market. The first ejidos in the country were formed about 1930 and now represent about 50% of Mexico's national territory (Thome, 1992). The Agrarian Law of Mexico recognizes three basic types of land classifications (Procuraduría Agraria, 1993). First, there are collective ejidal holdings over common lands, then an ejidatarios' holding over parcels, and finally the holdings of settlement land. Agricultural parcels traditionally are those held by ejidatarios. Landowners did not have full rights regarding land use and alienation as the ejido committee was required to give permission on any land transactions. Rentals and sharecropping were legally prohibited, although a limited form of renting (to outsiders only) has been possible since 1981 but rarely utilized.

Despite these regulations, an active land market flourished (Dewalt and Rees, 1994). Numerous anthropological and historical accounts detail the mechanisms of renting and sharecropping ejidal lands, particularly after 1960 when Mexican migration to the US boomed. In some studies there is an incidence of renting of lands is over 40%, with transactions occurring mainly among members, although some outside contracts occur (in rentals or sharecropping), and even land sales were carried out by convoluted inheritances (ibid). The existence of this black market in land could hamper current efforts at land regulation as any new project must identify who really has land rights to establish ownership and a fair value for the land (Dewalt and Rees, 1994).

Under the government of Carlos Salinas de Gotari, the Mexican government revolutionized land markets in 1992 by changing Article 27 of the National Constitution, the provision that established land reform. The main goal of the new legal structure is to provide greater ownership security to agricultural enterprises since private property holders rights are now protected from expropriation, and ejidatarios can gain permanent land use rights. This should encourage investments and the operation of land markets (Stanfield, 1995). The methods to increase tenure security differ across the various strata of producers; for the small-scale ejido producers the main thrust of the new legislation is to regularize land information and provide producers with land rights certificates, which is not yet a fee simple title.
Land rights are meant to be changed drastically. With parcel certificates in hand, ejidatarios will now have the right to rent out land, enter into joint ventures, or sell the land to other members of the community/ejido. However, the whole ejido assembly can vote to adopt full ownership over surveyed and assigned parcel land—the move to fee simple ownership—and then members may individually sell their land to outsiders (Stanfield, 1995). Since the inception of this program, owners of urban lands and rural house plots are given full private property rights.

Since 1992, an effort has began to survey ejidal communities with a view toward titling. The Procede Project—the Program of Certification of Ejidos Rights and Entitlement of Urban Lots—integrates staff from different Mexican land information institutions. The goal is to map and title all ejidal lands, which cover some 29,000 ejidos over 105 million hectares (nearly 52% of the country) (Stanfield, 1995; Thome, 1992). Part of the country is now mapped, and titling is underway. Basically PROCEDE is designed to provide certificates of permanent and inalienable use rights to agricultural parcels, titles to residential lots, and to certify membership in the ejido to give a voice to the use of ejido common lands (Myhre, 1996). Residential plots receive full title.

The process begins with the mapping of a community. Subsequently, the National Agrarian Registry processes a "title" for the community, which then is inscribed at the state-level property registry. Thus the project is being implemented without creating a new bureaucracy but instead coordinating existing programs. A separate state cadastre also is contemplated in the law, mainly for urban fiscal purposes. In fact, these state cadastres are very much under-developed and have made very little progress.

Actually, participation in Procede is voluntary and most ejidos have voted to not participate. As of September 1, 1995, 8,181 ejidos have been regularized over an area of 14,880,327 has. This means only about one-third of Mexico's ejidos are included (Myhre, 1996).

B. Key Information Institutions

Registro Publico—The property registry began in 1870 in Mexico as a deeds system like that in Spain. The Public Property Registry has offices in each state.

INEGI—INEGI (the National Institute for Statistics, Geography and Information) serves as the main mapping and surveying agency of Mexico. It maintains state-of-the-art computer and surveying equipment.

RAN—The National Agrarian Registry was created from the agrarian codes of 1934 and strengthened as part of the reform of Article 27 in 1992. It is meant to be the registry of deeds and transactions related to the agrarian reform process. RAN has thirty-three offices across the country (PROCEDE, 1991). This agency is in charge of completing individual parcel files for ejidatarios and registering all new property deeds over ejidatario agrarian plots and issuing corresponding certificates. RAN also is mandated to report these land registrations to the traditional property registry in each local; however, the past lack of coordination between the
Registro Publico and RAN has created situations in which the land descriptions do not match across the two offices (Salas, 1984).

C. Property Taxation

The Mexican state has historically assessed and collected very low levels of property taxes. In the late sixties, property tax revenue accounted for less than 1% of the federal government's tax receipts (Bird, 1974). Ejidal lands, covering nearly 50% of the surface area, are constitutionally exempt from property taxes, and other agricultural taxes (such as product taxes) cannot exceed five percent of the item's value (ibid). Article 196 of the Agrarian Code states that ejido members should instead pay a production quota (usually less than 5%) or a fixed per hectare land use fee, rather than a tax based on property value (Gonzales Ruiz, 1970). The taxation of agricultural income is set at 17%. The problem has been compounded by the fact that tax rates and procedures vary across the different states, and municipalities within a state, across Mexico.

Gonzales Ruiz (1970) examines the tax rules across Mexico and concludes that tax rates are the lowest in Yucatan (assessed at .3% of property value) and highest in Durango (3.5%). He argues that this differential goes beyond productivity gaps in the states' lands but reflects an unsettling trend of regional differentiation. Most states assessed taxes at less than 2% of the property's cadastral value (assuming the property had been assessed in a cadastral). Only three states (Aguascalientes, Colima, and Puebla) have progressive land taxes in which higher-valued properties face a different rate than lower-valued ones.

Since the ejidos have been mostly exempt of land value taxation, one of the challenges confronting the new PROCEDE program is how to deal with campesinos' concern about property taxation. Stanfield (1995) reports that very few ejidos issued title certificates have converted their lands to fee simple deeds and registered this tenure in the Property Registry, as these conversions would make them liable to pay property taxes.

II. Details of the National Cadastre System:

A. Origin and Purpose of the Cadastre

Not until the Porfriian era did Mexico professionals realize the necessity of elaborating a cadastral system for the country (Audirac, 1976). Actual mapping activities began sporadically in the Federal District, Sonora, Sinaloa and Quetaro after the Mexican revolution, and in 1964 several commissions were formed to begin creating a national integrated cadastral system. Reforming fiscal laws, adoption of aerophogramatic techniques, new valuation methods, and use of the UTM coordinate system were all envisioned.

B. Cadastre Methods and Production Levels

Basic cadastral aerial photos were taken in 1965 over Guadalajara at the scale of 1:500 in base of low flights at 1:2500. These original photos were done using the Kelsh restitution
apparatus with a precision of ±15%. Private survey companies were contracted out to experiment with a variety of mapping and airplane specifications. Centesimal apparatus was also used to build polygons-triangulations and mapping designs. Border measurement was the most difficult part of the work (Audirac, 1976). By the early seventies photogrammetric mapping had been done in four additional states and the federal district. The states of Mexico and Michoacan were the first to computerize the mapping data. In this period the government also created CETENAL (National Comission of Land Studies) to inventory at the scale of 1:25,000 and 1:50,000 (Audirac, 1976).

In 1992 the National Agrarian Registry was transformed into a unit of the Agrarian Reform Secretaria with technical, judicial, and budgetary autonomy. Up to March of 1996 RAN's work through the PROCEDE project had updated maps over 22 million hectares for 10,156 agrarian nucleuses. The two key methods employed are 1) the direct method of geodetic/topographic mapping by field measurements to get the geographic coordinates, which are supported by a GPS and traditional triangulation procedures and 2) an indirect method through aerial photos to identify the parcel and polygon vertices through photoidentification and references to UTM coordinates (Cabrera, 1996).

Under the new PROCEDE project a detailed list of procedures is to be followed. Once an ejido has agreed to participate in the program, members prepare a sketch map of ejidal lands, dividing them into agricultural parcels, common use, and housing. Then the assembly posts the sketch for correction and discussion before INEGI carries out the surveying using GPS to established monumented control points and tachemoetry techniques for coordinating the vertices of each parcel boundary. This formal map also is posted, discussed and then approved by the ejido assembly. The goal is to complete this mapping process within forty-five days (PROCEDE, 1991). After final mapping is done, RAN issues parcel certificates with the unique parcel number.

In the second phase of the project, beginning April 1993, new aerial photography of 220,000 km² was begun (Stanfield, 1995). Most of INEGI’s techniques for mapping and parcel boundary definition have been laid out in a series of manuals on "Technical Norms for Delimiting Lands in the Interior of the Ejido" (INEGI, 1994). Maps are to be completed of the whole ejido area, individual member parcels, common lands, and houses (PROCEDE, 1991). The acceptable methods include direct techniques of actual geodesic terrain measurements (physically moving around the parcel perimeter and locating the coordinates via GPS and theodolites) and indirect techniques using aerial photos (marking the vertices of the ejido and each parcel with pins corresponding to site visit boundary monumentation) (PROCEDE, 1991). In the first method, geodetic coordinates have been set by NAVSTAR satellites (Guerrero Ilemen, 1994). The aerial photos for use in the second method rely on photography over 781,000 km² of the country, with an additional 781,000 km² planned in 1994 to cover 75% of the country. Photo-identification brigades use 14 fixed GPS stations in Mexico and the new ITRF 92.0 system for geodetic reference with a dynamic center. INEGI's use of the land data was facilitated by the introduction of ARC-INFO GIS software systems and high-resolution photocomposition.

The actual map making is done in the SICE unit (Sistema de Informacion Cartografica
Ejidal) of INEGEI. Some 10 million maps are to be produced in scales of 1:100,000 to 1:100 (Guerrero Ilemen, 1994). There are thirty-three centers of mapping automation throughout the country. The data reserved from diverse sources (CSF files, digital photograms, rural croquis, photomaps, cedulas) are ordered into a new data file via GIS systems such as ArcInfo software and Oracle databases (Guerrero Ilemen, 1994). Each map is to include a geographical ID number and degree coordinates, information on the state, municipality, locality, polygon name, UTM projection used, and the signatures of the ejido representatives. By June 1994 INEI had completed 703,135 maps over 3970 ejidos (some 8.6 million has.) using the new procedures (ibid).

C. Cadastre Costs and Maintainability

Surveying and mapping done under the new PROCEDE project are financed completely from within the Mexican national budget, without being conditional on external financing (Stanfield, 1995). In the first year of the project this budget reached nearly 3,000 million pesos (Concheiro, 1994). Map and survey products are free to the PROCEDE beneficiaries (PROCEDE, 1991).

D. Staffing and Technical Capacity of the Cadastre System

INEGI and PROCEDE have over 15,000 employees across the country to complete the land regularization program (INEGI, 1994). The "superlative organization, technological-professional resources, and enthusiasm of the staff have been noted (Thome, 1992). For the PROCEDE project there are some 2,400 employees of INEGI working in mapping; this includes 1700 mapping technicians organized in brigades and 28 GIS specialists (Guerrero Ilemen, 1994). 70% of the INEGI employees have professional studies in information systems, and for the PROCEDE program all contracted employees completed a week long training program in UNIX, data base, GIS programming, etc.

III. Details of the National Property Registry

A. Registry Origin and Purpose

Property registration in Mexico is based on a system of "inscripción en libros" similar to the folio personal of other countries. The Mexican system has been linked historically to the Spanish system; however it is not a true folio real as most documents are arranged chronologically rather than by a parcel identification (Salas, 1984). Each state has its own property registry legislation and property registrar. Only the Federal District, Guerrero and Colinas States have adopted the folio real system, although Chihuahua is now converting from books to a folio real. This law in 1976 to update the Federal Register was meant to move it back to a Spanish folio real and computerize records there, but it still left the process of recording real estate transactions to be voluntary (Salas, 1994).

The property registry system is a deeds type system in that inscription provides public notice of a transaction. It does not provide a guarantee of ownership. In fact in the Federal
C. Costs and Data Maintenance Procedures

The registry is financed by state government based on an approved budget. All revenues generated are paid to that same state government. As part of the new registry reform effort, there is a desire to make the registry a semi-autonomous entity with self-financing capacity. Value added projects are being evaluated.

The Mexico City registry alone generates about US$30 million per year in revenue. Its budget for operation is about US$2.5 million. Inscription fees are based on a schedule produced by the state congress, and do not relate to property value.

D. Staffing and Technical Capacity

Employees are all public sector. There is no continuing education program, and with dismal salaries, expectations are that employees are unqualified at the time of hiring. No manuals or guidebooks exist for employees. Registrars are named on a political basis by the state governor for an unspecified term and must furnish bond.

V. The Coordination of the Cadastre and Registries into a Folio Real

In the property registry file, linkage is noted to a cadastre if the relevant State has one. In Mexico City, for example there is little area covered by the state cadastre, so extremely few parcels refer to a cadastral system. As states have done very little to promote their state cadastres, linkage with a cadastre remains only a legal theoretical outcome. In fact, registration is not backed by cadastral surveys. In rural areas under the PROCEDE program, INEGI and the Registro Agrario Nacional are taking leadership to ensure that new properties inscribed at state property registries are backed by accurate cadastral information.

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