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LAND REGISTRATION FOR THE URBAN POOR IN NICARAGUA: A STATUS REPORT WITH RECOMMENDATIONS

by

Steven E. Hendrix
and
Stephen J. Leisz

Submitted to:

Ministry of Finance, Government of Nicaragua
United Nations Development Programme
Inter-American Development Bank
and
The Latin American and Caribbean Bureau of the
U S Agency for International Development

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EXECUTIVE SUMMARY

The United Nations Development Program (UNDP) is assisting the Government of Nicaragua (GON) to resolve its property crisis As part of a broader strategy, the UNDP would like to assist the GON to title urban properties in marginal neighborhoods To this end, the Inter-American Development Bank is willing to contribute about US$500,000 to the UNDP effort

An urban titling initiative is imperative Poverty conditions in Nicaragua are surpassed only by Haiti in the western hemisphere There is growing land tenure uncertainty as the country moves toward the next elections With 100,000 urban titles outstanding, at least 75,000 of which are in the capital, a potentially politically explosive situation is developing

Vice Minister for Property Leopoldo López has made clear that he would like to see 100,000 titles given out in the next 18 months Of these 100,000 lots, 75 percent are located in Managua The other 25 percent are all over the country The Vice Minister stresses that the titling effort should be done in a serious, technically-sound fasion, so that there is no dispute as to the validity of the documentation

Unfortunately, three institutions, each with its own limitations, constrain the issuing of titles The property registry is organized under the Supreme Court and currently has entirely manual procedures Many of its procedures are inefficient and duplicative of efforts by other institutions All transactions must be noted in a reception book, called a *diario* Persons using this book are physically capable of copying in perhaps only 50 to 70 transactions per day This alone limits productivity This constraint should be immediately addressed in a coordinated fashion with the World Bank, which is engaged in a longer-term effort at registry and cadastral modernization More radical steps, such as restructuring the institution, automation, and use of declared registration zones should also be explored

The physical cadastre is maintained by INETER, the Nicaraguan Institute for Territorial Studies, under the control of the Construction and Transport Ministry Its staff is well trained and organized, but the institution lacks the financial resources to purchase modern equipment that would allow for more rapid production of cadastral maps These maps are needed to inscribe titles at the registry and are very helpful in compensation of former owners and in planning INETER has suggested using aerial photography together with GPS to attack the problem We believe, however, that the competitive bidding for the photography and other related deliverables will be too slow for the Finance Ministry's timeframe Thus, it is recommended that INETER proceed with a combination of GPS surveys and traditional surveying techniques, and later add in aerial photography

The Urban Titling Office (OTU) is perhaps the most optimistic institution Organized under the Finance Ministry, it processes claims relatively quickly when it has appropriate cartographic information and where prior owners have been compensated This underscores

the need for some resolution of claims with *confiscados* Such a settlement is being explored by the Carter Center with support from the Land Tenure Center

Beyond dispute resolution, what is now needed is a broad, land access strategy in favor of the poor via market mechanisms, possibly to include land regularization and normalization, land banks, mortgage banks, integration of the various cadastral and titling initiatives, land for infrastructure exchanges and so on A coordinated, market-friendly strategy is needed to ensure broad economic participation Lack of such a strategy for the poor would be market naive

TABLE OF ACRONYMS

CADD	Computer assisted drafting and design
CNRC	Consejo Nacional de Revision de Confiscaciones (National Council for the Review of Confiscations)
DMA	United States Defense Mapping Agency
GIS	Geographic Information System
GON	Government of Nicaragua
GPS	Global Positioning System
HABITAT	Centro de Naciones Unidas para Asentamientos Humanos (U N Center for Human Settlements)
IDB	Inter-American Development Bank
IMF	International Monetary Fund
INETER	Instituto Nicaraguense de Estudios Territoriales (Nicaraguan Institute for Territorial Studies)
INIFOM	Instituto Nicaraguense de Fomento Municipal (Nicaraguan Institute for Municipal Development)
INRA	Instituto Nicaraguense de Reforma Agraria (Nicaraguan Institute for Agrarian Reform)
LAN	Local area network
LIS	Land Information System
LTC	University of Wisconsin Land Tenure Center
MPLIS	Multi-Purpose Land Information System
OCI	Oficina de Cuantificacion de Indemnizaciones (Indemnization Calculation Office)
OOT	Oficina de Ordenamiento Territorial (Office of Territorial Ordering)
OTU	Oficina de Titulación Urbana (Office for Urban Titling)
PNCTR	Programa Nacional de Catastro, Titulacion y Registro (National Cadastre, Titling and Registry Program)
UNDP	United Nations Development Program
UNO	Unión Nacional Opositiva (National Opposition Union)
USAID	U S Agency for International Development

SECTION I
TERMS OF REFERENCE

The United Nations Development Program (UNDP) is assisting the Government of Nicaragua (GON) to resolve its property crisis As part of a broader strategy, the UNDP would like to assist the GON to title urban properties in marginal neighborhoods To this end, the Inter-American Development Bank is willing to contribute about US$500,000 to the UNDP effort

In coordination with the Nicaraguan Finance Ministry and the Vice Minister for Property, UNDP invited a Land Tenure Center team to Nicaragua to define the urban titling program More specifically, the purpose of the visit was

(1) discuss with GON officials the scope of the GON initiative to title 100,000 urban lots in the next 18 months, and summarize that initiative for the UNDP,

(2) provide recommendations to the GON of any alternative approaches, organizational structures or technologies which could advance the GON proposal, based on comparative cadastral modernization experiences,

(3) help develop terms of reference for the contracting out of the titling effort, and

(4) collaborate with the GON in the selection of firms for the carrying out of the effort

The Land Tenure Center team comprised of Steven E Hendrix and Stephen J Leisz arrived on the afternoon of Tuesday June 27, 1995 Stephen Leisz departed on Saturday July 1, 1995 UNDP invited Steven Hendrix to remain in country until Thursday, July 6, 1995 to participate in political meetings in Montelimar concerning broader issues of land tenure and dispute resolution

This report is being prepared under an extreme time constraint due to the urgency of the request from the Finance Ministry Consequently, while the authors have made every attempt to be as accurate as possible, the length of visit did constrain analysis, and thus the appropriate institutions should be consulted for definitive answers regarding current status and policy The opinions expressed in this report are those of the authors and do not necessarily reflect the position of any other institution The authors wish to thank the Government of Nicaragua, the United Nations Development Program and the U S Agency for International Development for their strong cooperation and support

SECTION II
BROAD PROBLEM STATEMENT

A BACKGROUND

Mark Schneider, U S Agency for International Development (USAID) Assistant Administrator for Latin America, has argued unequivocally

> One only has to look at the tragedy of events in Chiapas to illustrate the gravity of failing to address land security for the poor There are also few issues as potentially destructive to our hopes for consolidating democracy and achieving sustainable development than the denial of access to land and property rights for the poor Formalizing land ownership gives a sense of purpose, a stake in society and a seat in the community council It also is the key to unlocking the door to rural credit, to new technology and to the infrastructure for rural development (AID) is pledged to promote land security for the poor [1]

Nicaragua is a low-income country with substantial poverty, especially in rural areas After an extended period of decapitalization of production in nearly all sectors, the country now needs to reverse this trend Resolution of property ownership disputes can help on both fronts poverty and investment

Nicaragua has widespread property ownership disputes, many of which have their origin in conflicts over the Sandinista agrarian and urban reform programs designed to redistribute farms, factories and houses The roots of the crisis have been examined elsewhere, and do

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[1] Mark Schneider, AID Assistant Administrator for Latin America, Address at "Property for the Poor: The Path to Development" Conference, Washington, DC (April 12, 1994) The reference to Chiapas refers to a peasant uprising in southern Mexico which began on January 1, 1994. One of the main issues in that uprising was land rights and inequitable land distribution in the State of Chiapas

not need to be repeated here [2] It is sufficient to note that a large proportion of Nicaragua's population feels either dispossessed or insecure

The task Nicaragua faces is to deal with thousands of overlapping claims to property in such a way as to redeem past promises where that would reduce poverty, and to re-establish the security of all those who either receive or retain property, so that re-investment can move ahead Part of this task, and the subject of this report, is the application of newly available technologies and techniques which may accelerate surveying of small urban lots that are ready for titling to new recipients

For rural areas, A World Bank rural titling project is underway, coordinated by INRA [3] The other institutions involved are the Supreme Court (property registry) and INETER As part of the World Bank initiative, INETER will be taking aerial photographs next year in the Central and Western parts of the country at a scale of 1 50,000 [4] In the eastern part of the country, INETER will rely on Landsat or Spot satellite imagery, to be taken at a later date INETER will also be purchasing orthophoto equipment with the goal of creating a base of orthophotos for the western and central parts of the country

This report concentrates on the technical aspects in an urban setting of the first issue regarding property getting titles into the hands of the urban poor At present, to obtain a title on state land, there are three major bottlenecks First is the process at the *Oficina de Ordenamiento Territorial* (OOT) The OOT has been providing qualified beneficiaries of land with *solvencias* A *solvencia* is simply an administrative document, demonstrating that the

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[2] See, for example, Stanfield and Hendrix, Ownership Insecurity in Nicaragua, 22 Cap. U L. Rev 939 (1993), Hendrix, Innovaciones a la legislación agraria en América Latina· Los casos de Perú, Honduras, México y Nicaragua) (1994), Hendrix, Property Law Innovation in Latin America with Recommendations, 28 Boston College Int'l & Comp. L. Rev 1 (1995), Hendrix, The Crisis of Land Law and Policy in Nicaragua, 29 Comp Jur Rev. 3 (1992)(Spanish version La Crisis Política y Derecho Inmobiliario en Nicaragua, 29 Comp Jur Rev 25 (1992)), McCoy, Carroll, Elliott, Hendrix and Yarn, Nicaraguan Property Disputes, Working Paper, The Carter Center of Emory University, April 1995; Stanfield, "Insecurity of Tenure in Nicaragua" (Land Tenure Center Research Paper 120, 1995); Strasma and Molina, "Accelerating the Resolution of Property Cases in Nicaragua, 1994" (Land Tenure Center, 1994), World Bank, "Staff Appraisal Report Nicaragua Agricultural Technology and Land Management Project" (1993)

[3] Programa Nacional de Catastro, Registro y Titulación (PNCRT)

[4] Bidding is open starting on July 16, 1995

Administration has determined that the occupant is a qualified beneficiary under rules for housing or urban land access It is not a title and does not include geodetic information [5] This means, in formal legal terms, that the beneficiary will be unable to mortgage, buy, sell, rent or give away the land It should be recognized that OOT/OTU/OCI is the least problematic of the three constraints, and that the situation in INETER and the property registry presents a much more difficult challenge for the moment Unfortunately, government efforts have not focused to the degree necessary on the two later components

The second bottleneck occurs when, the OOT *solvencias* are passed to INETER for a physical description of the land, defining property boundaries through surveys To be titled, the lot must have an accurate geographic description and a deed from the owner (presumably the State) to the new occupant This information must then be inscribed at the property registry, at which point a title is issued

The final bottleneck is found with inscribing the documents at the property registry, and delivery of title to the new owner

The Government has made clear that he would like to see 100,000 titles given out in the next 18 months Of these 100,000 lots, 75 percent are located in Managua The other 25 percent are all over the country The Finance Ministry stresses that the titling effort should be done in a serious, technically-sound fasion, so that there is no dispute as to the validity of the documentation The rural land administration effort with the World Bank, unfortunately, will not help much in this urban goal maps to be produced are not at an appropriate scale for urban property (1 5000 or 1 1000) nor is it the correct timeframe for getting the urban titles through the system within 18 months Consequently, this report seeks to give the Government additional alternatives for action

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[5] Geodetic information is information related to or determined by geodesy Geodesy is a branch of applied mathematics that determines the exact positions of points and the figures and areas of large portions of the earth's surface, the shape and size of the earth, and the variations of terrestrial gravity and magnetism

SECTION III
DISCUSSION AND ANALYSIS OF CADASTRAL ISSUES/INETER

INETER is the Nicaraguan mapping agency One of the primary responsibilities of INETER is to maintain and update the geodetic network of the country The country's network of geodetic control points consist of 50 first order control points, 12 of which are located in Managua The locations of the current network of geodetic control points are given according to the North American Datum of 1927, which is based on the Clarke spheroid of 1866 One of the first order control points located in Managua has also been tied into the worldwide network of geodetic control points, which are related to the World Geodetic System of 1984 (WGS 84) Nicaragua also has a fairly dense network of secondary and tertiary geodetic control points throughout the country INETER standards dictate that first order control points have an accuracy of +/- 5cm, second order control points have an accuracy of +/- 10 cm, and third order control points have an accuracy of +/- 20cm

What is a datum?

Horizontal and vertical datums are networks of control monuments and bench marks whose horizontal positions and/or elevations have been determined by precise geodetic control surveys These monuments serve as reference points for originating subordinate surveys of all types In the past, datums have been based upon a locally best fitting ellipsoid (an ellipsoid that is a mathematical approximation of the earth's surface) With the advent of GPS, a world wide reference system (WGS 84), an earth-centered, earth-fixed, three dimensional coordinate system, with an ellipsoid that best approximates the surface of the earth as a whole, has been developed

Since GPS data relate to WGS 84, all processing of data should be done in this system and then transformed into the local reference system In order to do this, the relationship between WGS 84 and the local reference system must be computed This can be done if the position of the monuments in the network of geodetic control points is known in both systems In Nicaragua, the U S Defense Mapping Agency has determined the WGS 84 location of one first order control point in Managua The rest of the first order control points' WGS 84 coordinates were to have been determined by April of 1995, but this has been delayed until 1996

Unfortunately, INETER does not have current data on many untitled parcels And even on properties which do have titles, boundaries have changed, lots have been parcelized into small houses, and public lands and rights of way have been invaded

What are orthophotographs?

Orthophotos are orthographic photographs, or, in other words, they are planimetrically correct photographs They do not contain the scale, tilt, and relief distortions that characterize normal aerial photographs In short, they are "photomaps " Like maps they have one scale, even in varying terrain, but unlike maps, the terrain appears in "true," photographic, detail, not as representative lines and symbols

Orthophoto production has traditionally been a time consuming process, and it is not unusual for a lag time of one and half to two years between the taking of aerial photographs and the delivery of the finished orthophotographs Complicating this, countries in the developing world often have last second conflicts over secrecy rules with military authorities that sometimes delay orthophoto production

On the positive side aerial photographs allow residents to point out their properties to surveyors, giving a sense of participation, and orthophotos are currently being used with great success to title small, fractured agricultural parcels in Paraguay at 1 5000 scale Orthophotos are especially useful when property boundaries are clearly identifiable on air photos However, the air photos usually have to be taken during the dry season

INETER is also the implementing agency for the municipal cadastres The U N HABITAT Program has purchased equipment for the Municipality of Managua, which is currently being used at INETER As part of the project, INETER is taking all the maps of Managua and digitizing them INETER already has a digitizing table, an Integraph pentium personal computer with one gigabyte of hard-drive and twenty megabytes of RAM, a Hewlett Packard plotter, and a bubble jet printer The software being used is Integraphs Micro Station (a CAD system) and SysCAD, a relational database

INETER's professional staff appear highly qualified and have generally done impressive work on cadastral components of the World Bank project underway

A review of INETER's work in urban areas shows that dispute resolution has not been a problem The vast majority of property boundaries are clearly visible Further, INETER has always notified local community representatives of the institute's work prior to commencing with the surveys As a result, virtually no boundary disputes are found and surveying proceeds unhindered

1 Summary of INETER's main constraints

The major constraint facing INETER is financial they simply lack the manpower and modern tools to carry out their tasks They continue to use traditional technology of theadolites and tapes to survey in parcels

In terms of the Vice Minister for Property's directive of surveying and titling 100,000 parcels in 18 months, INETER is not prepared Just Managua is 312 square kilometers At 1 5000 scale, 600 photos would be needed Using tradtional photgrametry techniques with no automation, the survey process for the 75,000 Managua lots would take about three years

What is a CADD?

Computer aided drafting and design (CADD) software provide the capacity to design and draw maps and diagrams in real-time using a computer

What is a GIS?

A geographic information system (GIS) is a system of hardware, software, data, people, organizations, and institutional arrangements for collecting, storing, analyzing, and disseminating information about areas of the earth, also a data base management system used to store, retrieve, manipulate, analyze and display spatial information (Software used in a GIS often consist of relational data base software tied to CADD software)

What is an LIS?

A land information system (LIS) is a geographical information system having as its main focus, data concerning land records

What is an MPLIS?

A multi-purpose land information system (MPLIS) is a system in which the fundamental means of organizing data is the cadastral or proprietary land unit, whose main objective is the provision of institutional data concerning land ownership, value and use

2 INETER's Proposal

As part of the World Bank project, INETER is carrying out orthophoto mapping This is not what is being proposed for urban areas Orthophotos take about two years to produce In Managua, INETER wants to use aerial photography to survey the *barrios marginales* INETER would fly over the city (about 5 hours to photograph the entire city at 1 5000) and use traditional photogrametric techniques to digitize from the photographs the boundaries of

the neighborhoods and the boundaries of individual parcels INETER would like to do aerial photography because it believes it would be more cost effective than to physically go on the ground and actually survey out each of the individual parcels

By using this type of aerial surveying INETER believes it can survey the neighborhoods twice as fast (in 18 months) as it would take to survey them using traditional methods (estimated at 3 years) However, in order to do this, one would have to start the project today, and this would cover only Managua, and would address only INETER's constraints, not those of the registry or OTU In order to carry out this project INETER's proposal includes requests for the requisite aerial photos, three GPS receivers, one digitizing table, one pentium PC, one 486 PC, one Hewlett Packard plotter, one printer, Integraph Micro Station software, and Oracle MGE software (a relational database software)

What is GPS?

Formally called the Navigation Satellite Timing and Ranging Global Positioning System (NAVSTAR GPS), GPS was designed by the U S Defense Department It uses 24 satellites orbiting the earth in very high, stable, orbits GPS allows one to carryout geodetic surveys with a high degree of accuracy Positions are calculated using triangulation--measuring the distance a point on the earth is to three or more satellites simultaneously [6]

For convience sake, some people have classified GPS as providing low, medium and high accuracy position fixes "Low accuracy" GPS provides a positional fix to +/- 100 meters In order to obtain this level of accuracy, one receiver is used and four satellites are read only long enough to collect a positional fix Position locations collected using this method are often good enough to roughly demarcate forest reserves or large territories Single unit GPS is also often used for navigational purposes, since GPS receivers can cost as little as $500 "High accuracy" GPS refers to using GPS receivers to obtain positional accuracies to the centimeter or sub-centimeter unit This method requires that two GPS receivers be used One, which is very accurate and has the capability to download large amounts of positional information obtained from the satellites that are in view, is located as a "base station" over a first order control point, the second acts as a rover and is used to collect positional information in the field On a daily basis, after field work is completed, the position locations collected by the rover are differentially corrected using information collected by the base station The precision with which accurate positions are collected depend upon the amount of time the rover rests at the point in the field To obtain centimeter accuracies, the rover should rest at the point for around 30 minutes "Medium accuracy" GPS uses the same method as high accuracy GPS except that the rover only rests at the point for around 30 seconds This amount of time is long enough to get accuracies, once differentially corrected using information from the base station, to +/- 50 centimeters

The main advantages of medium accuracy GPS are (1) it can be accurate enough for survey purposes, if +/- 50 centimeters is within the order of accuracy desired, (2) occupation time at a point is minimal, (3) training staff for use of a rover can be done in about an hour

[6]While three satellites are theoretically all that are needed in order to determine a single point on the earth's surface, in reality, four satellites should be used in order to correct for offsets

The field work of INETER would be facilitated by the use of the three GPS receivers One receiver would function as a base station It would be located over the control point in Managua that is already tied into the worldwide network of geodetic control points The other two receivers would be used as rovers They will be used to establish first order control points in the neighborhoods where surveying will take place INETER could also use the rovers to establish second order control points in the neighborhoods

GPS Hardware Costs

Rovers cost around $10,000 Specifically, the Trimble 8 channel Pro XL with 1 megabyte of memory costs $10,450 and the 8 channel Pro XL with 640 kilobytes of memory costs $8,950

Base stations cost between $10,950 and $16,950 Specifically, the Trimble 12 channel Pro XL with 4 megabytes of memory costs $10,950, the Trimble Pathfinder community base station (with 12 channels) costs $9,950 plus a personal computer (which can cost from $1500 on up), and the Trimble 4000 SE (12 channel) costs $13,500 plus a single frequence antenna which costs $3400 All of these configurations are specified to provide sub-meter accuracy The advantage of the Pro XL base station is that it is more mobile The Pathfinder provides automatic logging of files (as it is continuously attached to a personal computer) The 4000 SE is a base station that is often used by professional surveyors However, all three base stations have the same basic GPS receiver as its kernel

Once the first order control points are established and aerial photography is in hand, INETER will digitize the boundaries to the barrios and the individual parcels from the photos [7] INETER will register these boundaries to a map base of the first order control points and use photogrammetrical methods to create an accurate cadastral map of the barrios and parcel boundaries

After the cadastral maps are made from the aerial photographs, INETER will send teams out to the *barrios marginales* to locate the parcel corners from the cadastral maps and drive metal stakes in as corner monuments It is believed that the parcel corners will have an accuracy of +/- 20 cm (third order accuracy) by following this method INETER is proposing the use of aerial surveying because they believe that this method will reduce the cost of carrying out the physical survey and be more economical However, aerial surveying may not be more economical if INETER has to wait eight months, provided that there are no

[7]The 23 cm aerial photos will have to be enlarged so that the boundary lines can be accurately traced on a digitizing table

complications, just to get a contract through the bidding process [8] This means waiting until February 1996 to contract the firm for the aerial photography After this, the photos have to be delivered, boundaries digitized, photogrammetrical corrections made, cadastral maps produced, and corners monumented Also, during this period the GPS surveying of the first order control points must be done Ideally, this surveying would take place in conjunction with the flyover so that monuments could be erected that would appear in the aerial photographs (thus facilitating the photogrammetrical correction process), however, due to the uncertainty of when the flyover will take place, this may not be done

It should be noted that there is another reason INETER has requested the aerial photography Other governmental units and institutions, National Defense, Civil Defense and the Mayorality, would also like access to current aerial photography Aerial photography could help them update defense and evacuation plans, and also facilitate urban planning efforts

When the titling effort in Managua is complete, INETER plans to take the GPS receivers to the other cities where titling efforts are underway Depending on funding, INETER may decide to purchase additional units and leave the base station erected in Managua

Qualified surveyors will also be needed to carry out this proposal In Nicaragua there are currently around 300 licensed surveyors These surveyors either have the appropriate university degree or have passed an exam administered by INETER The World Bank has already prepared a list of pre-qualified surveyors, and according to the local World Bank representative, has contracts with most if not all of the best qualified surveyors in the country The IDB and UNDP may want to consider using this list in order to identify and contract out the urban surveying work required for this project

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[8]This time frame could be cut to six months if IDB and UNDP agree to accept the list of firms pre-qualified for taking aerial photographs that has already been compiled by the World Bank project for the rural titling project

SECTION IV
DISCUSSION AND ANALYSIS OF THE PROPERTY REGISTRY

1 Introduction to the Registry

The *Registro de la Propiedad Inmuelble y Mercantil* (Real Estate and Commercial Registry, hereinafer referred to as the property registry) presents another constraint in the titling process for urban properties The registry fuctions both as a real estate registry and as a corporate registry The institution falls under the direction of the Supreme Court, and is run in accordance with provisions in the Civil Code and a *Reglamento del Registro Público* (an administrative order) which provides operational guidance In all, there are 16 autonomous, decentralized property registries in the country, one in each department Of these, six have been microfilmed

The condition of the registry in Managua is typical if not better than average in Central America The office has no photocopiers Central air conditioning does not work, although the Registrar does have an individual unit which functions The office is relatively clean The public is attended at a large counter, providing adequate protection for documents, although no security guard was observed No electric generator is available, and electricity often fails at some point during the day, hindering productivity

Within the registry, 59 percent of personnel are women 63 percent have only a high school education, with less than 5 percent having a university degree 60 percent receive about US$1200 per year in salary 60 percent of employees have less than six years experience, with this being divided equally between 0-2 years experience (20 percent), 2-4 years experience (20 percent) and 4-6 years (20 percent) Low salaries create incentives for employees to seek supplements in the forms of bribes just to pay living expenses

As part of the World Bank's rural titling initiative, Miguel Gómez (the World Bank's Nicaragua Representative) reports that a Costa Rican attorney has been hired to provide a diagnostic on the property registry This report is due out shortly Margarita Arguello of INRA advises that a commission is to be set up shortly in Nicaragua to examine the registry

2 The Folio Real System

The *folio real* system is found in many Latin American countries In Costa Rica, this same basic system has been largely automated In the traditional registry in El Salvador, and other places, like Nicaragua and Guatemala, the registry system is entirely manual, using no automation, photocopy, or microfilm technology Instead, the system uses a series of books

(Receipt books, *folio real* books and Copy books (tomes)) The specific steps involved in a transaction, under either the *folio personal* or *folio real* systems, is outlined in Table 1

Table 1 Inscription of a Transfer of Property

Property Registration Process at a Generic Traditional Registry in Central America Sample Property Transfer		
Steps	Usual time	Comments
1 Presentation	Less than half an hour	Presentation of a registration request is carried out at the public counter The request is called a *diario* The *diarios* are usually presented by lawyers or notaries to one of two windows where the receipt of the document is recorded The receipt book contains columns for owner name a document number (assigned serially by month), and the volume and page where copy of document is actually filed (in the tomes) The time and date are also stamped on the back of the last page of the document Two copies must be presented for recording with a copy kept for filing and the original returned to the owner
2 Micro-filming	Microfilming of documents is relatively up to-date, without any backlog	Microfilm copies are made and stored on site
3 Marginalization	A delay of about three months	Marginalization is a process of making marginal notes, indications of a transaction pending The delay of about three months creates opportunities for fraud via multiple sales of a single parcel prior to completion of marginalization
4 Distribution	Little delay	Distribution of the transaction is made to a working group which will inscribe the transaction Working groups are referred to as cells," or celulas in Spanish
5 Confrontation	Usually several days However if someone else is using the book(s) needed to carry out the confrontation the examination is put on hold until the book(s) is/are available In practice this means months in some cases	Confrontation consists of examination of the document against the existing records in the Registry

6 Qualification	Assuming there is no problem the document will pass the qualification in about a week If a problem arises however, the process bogs down and can carry on for as much as ten years	Qualification involves a scribe who drafts up the document, which is then approved by a Registrar
7 Typing	In El Salvador for example, as of July 1994, there was a several month backlog in this office	This involves preparation of a summary in the *folio real* or a note in the *folio personal*, according to the case The same persons responsible for preparing the textual notes also receive public inquiries Consequently, they spend most of their time answering questions rather than processing new documents
8 Photocopying	This now takes about three days	This activity is done on site
9 Completion	Little delay	a) If a *folio real* transaction the documents are microfilmed This process is up to-date The documents are then forwarded to the registry's internal cadastre office
	Little delay	b) If a *folio personal* transaction the documents are sent straight to the registry's internal cadastre office

The traditional registry structure has several significant drawbacks Large rooms are needed to contain all the volumes of the *folio real*, as the number of books and paper required to maintain the system is staggering In theory, all information about a parcel is on one page, with a new page begun for each parcel In practice, the information on many parcels is carried over to one or more additional pages In extreme cases, it is necessary to examine dozens of pages in dozens of books to fully examine all the information about a particular parcel Therefore, although the registry has the form of a parcel-based title registry, it is in fact much like the US deed recording system, using, instead of owner name, parcels as the primary indexing key

Table 2 Technical Description of a generic *Folio Real* System

The *folio real* is usually a large book (about 15 by 18 inches) containing about 250 pages per volume The pages are two-page sets, facing each other The left page has three major and several minor columns containing information about rights to the property For example, the inscription (parcel description) is placed in the second of the three major columns Only one inscription is written for each parcel The left column contains any annotations such as judgments The right hand column contains information on cancellations, such as cancellation of a use right The right hand page also contains three major columns and several minor columns, all related to encumbrances on the parcel For example, mortgages and liens are noted in the center column Columns for annotations and cancellations, similar to the left page, are also available for the encumbrances page All entries are handwritten or typewritten

Related to the problem of access to books and records is the extreme delay, sometimes as long as ten years, in the qualification stage of the process Delays occur in this area when a title has some defect, either in form or substance Entire rooms of documents now sit unattended, awaiting final adjudication This presents at least the appearance of an opportunity for corruption, as persons wishing to get their documents pushed out of this category may seek to entice registry employees with bribes

Another defect in practice with the *folio real* system is its use of supplementary titles, called *títulos suplementarios* [9] Supplementary titles are used in some cases, to avoid the cost and time of registering title If an owner can claim the land by adverse possession, demonstrating occupation of the land and other formalities for a certain period of time, the Registrar can issue this "supplementary title " This avoids the need (and cost) of doing a complete title search The result is that sometimes parcels are titled two, three, or four times, without ever actually registering an existing deed Often, due to poor management, the Registry employees do not cancel out prior titles Thus, multiple titles can exist for the same property

Another major problem with the traditional registry system in Nicaragua, like El Salvador, is employee dissatisfaction Salaries are low and labor problems are common This is not necessarily a registry-specific problem, rather one that affects civil service employees rather than the private sector

A final problem with the *folio real* is its lack, in practice, of any cross-reference to any cadastral number or parcel identifier code for properties in the registry system In El Salvador, until recently, this was perhaps due to the civil war, which prevented

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[9] For a comparison with El Salvador, see Art. 699 et seq of the El Salvador Civil Code

implementation of this cross-reference, although the forms for cross-referencing were always available

> What is a "title" or "land registration" system?
>
> Most people use the terms "titles (or land registration)" and "deeds" interchangibly But registration of a deed only makes public note of a document It does not necessarily prove who the owner is, unless it is noted in the transaction The information found in a deed, may or may not coincide with previous deeds Therefore, errors may be consistently duplicated from deed to deed [10] This is in contrast with "title" registration systems

3 Current Financial Picture

The *Ley de Arancel*[11] establishes what fees can be charged for services at the registry Fees collected for service are, for example 5 córdobas per 1000 of value for the sale of a property, 2 per 1000 for cancelation of mortgage All money collected is paid to the central treasury without any retention to offset costs of collection The registry is financed within the Supreme Court budget

The present financial structure of the registry represents a public finance deficiency Registry activities and improvements could be largely self-financing However, because it does not retain any revenue, it is unable to carry out its functions in an efficient or legally-sound fashion

4 Major Constraints

Perhaps the most serious constraint at the registry is the reception book (*diario*) As in most jurisdictions, Nicaragua follows the legal precept that "first in time is first in right " In other words, to determine priority of claims, it is important that the registry system capture information as to who presented what documents when to establish true ownership In the *diario*, the receptionist receiving the document should note the time, date, document number, page and volume (*tomo*) for each transaction

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[10] Peter F. Dale y John D McLaughlin, *Land Information Management* (1990) page 22

[11] Ley de Arancel, 21 April 1993, Gaceta Oficial No. 73

There is already on the table a proposal to modernize the *diario* That proposal, made to UNDP about a year ago, requests just under US$10,000 to computerize this one piece of the registry

Manual procedures slow processing of titles Inscribers copy by longhand not just fields of data, such as owner's name, parcel number and new owner, but also duplicative information such as physical boundaries (already in the INETER database) and value (captured by the Fiscal Cadastre) Further, this data is captured in narrative form, rather than as raw data

The Vice Minister for Property estimates a backlog of between 12 and 15 years for granting some titles already in the system A single reception book (*diario*) means that documents can only be processed once passing that stage in the inscription process

Presently, there are 50-70 transactions per day at the Registry This work is done by 18 inscribers Unfortunately, only 2 persons supervise this effort Consequently, only about 25 titles per day actually emerge from the process signed by the Registrar At this rate, 100,000 parcels would require about six years to complete

SECTION V
DISCUSSION AND ANALYSIS OF THE URBAN TITLING UNIT (OTU)

The final constraint is at OTU This is the problem of indemnization No titles can be issued until the former owner is paid In terms of process, to obtain a title on land claimed by a previous owner, title cannot be granted unless the prior owner has been indemnified by the government In other words, title should normally pass from the prior owner to the state via indemnification, and then from the state to the present occupant This involves a complicated process with the Oficina de Cuantificacion de Indemnicaciones together with OOT and Catastro Fiscal

Once OTU receives verification that a former owner has been paid, it proceeds to have the parcel inscribed in the name of the State Then, INETER can divide that larger lot into the small urban parcels Once this is done, OTU drafts an *excritura*, a legal document which transfers the lot from the government to the new owner This is then inscribed at the registry, and a title is given to the new owner

Of 87 neighborhoods investigated by OTU, 23 were in hands of the state or institutions of the state Consequently, these could be issued *escrituras* as soon as survey information was ready The *escrituras* would then be presented to the registry for inscription Once inscribed, the occupant could be given a title

However, on 54 of these 87 *barrios marginales* remain titled to former owners This means that there are about twice as many in private hands as in public hands Ten more remain in a mixed state of public and private ownership, complicating the process Until these lands are state property, no *escrituras* can be issued

Although OTU investigated 87 neighborhoods, there are a total of 166 *barrios marginales* that need titling Because of a lack of physical cadastral information from INETER a complete picture of the neighborhoods is impossible at this point, and OTU is prevented in its review of the other neighborhoods Interestingly, more former owners could be compensated if accurate, up-to-date geodetic survey information existed Correct boundary definitions are crucial to OTI's effort to provide adequate compensation If digitzed boundary information was available, INETER could overlay current *barrio marginales* boundaries on old cadastral maps and more accurately determine where *barrio marginales* overlap public (state) or private lands This would facilitate the process of approving or deny former land owners claims and generally ameliorate the indeminization process

A political agreement to deny former owners the remedy of recuperation of the asset and allow for only monetary damages would allow the state to get its hands on the property

sooner This would remove the constraint of lack of state ownership However, such a solution may not have a consensus either domestically or internationally

Interestingly, when compensation has been paid, and survey information is availabe, OTU works quickly For example, in the Annex to Villa Libertad, there are about 1200 individual parcels looking for title Cadastral information was complete in February 1995 Legal research at the registry was also completed that same month Legalization of the parcelization was completed in April 1995, with 705 *constancias catastrales* (survey information cards needed for titling) being issued Almost instantly, 700 *escrituras* were then issued from OTU But then OTU hit the registry bottleneck Only 450 of those have actually been registered and inscribed

Currently, OTU is processing 5,000-8,000 *escrituras* per month from the government's lone notary This could easily be increased by adding a second or third notary, complete with assistants and equipment This would double or triple production

SECTION VI
CROSS-CUTTING THEMES

Complicating the titling effort is an organizational structure that makes coordination difficult Dispersion of land administration among units of government The fiscal element remains inside the Finance Ministry, as does CNRC, OTU, OCI and OOT The legal description of property is under the control of the Supreme Court The physical description of the land falls under the perview of the *Ministerio de Construcción y Transporte* The attorney general for property is an employee of the Justice Ministry

Similarly, there are various donors involved in differing initiatives with different timetables UNDP has supported the Catastro Municipal through its HABITAT Program This is basically an urban, fiscal cadastre, property maps are being digitized, where available, and updated or created where possible The software being used is Integraph's Micro Station (a CADD software that is used in many places as the base software for GIS/LIS) and SysCAD (a relational data base developed for the UN and used in other LIS, notably in Bolivia) The Mayorality of Managua insists that this equipment be used exclusively for the Managua fiscal cadastre

The World Bank program is trying to address national organizational needs in the area of the cadastre It is funding a nationwide geodetic survey and updating of the national network of geodetic control points in rural areas in support of a long-term program whose aim is to modernize the land administration The end product of this will be the implementation of a multi-purpose cadastre (or multi-purpose land information system - MPLIS) The estimated completion date for this project is June of 1998

In the urban areas, the Vice Minister for Property's program with the IDB/UNDP is supporting an attempt to title 100,000 small urban lots, mainly in Managua, within 18 months This information will complement the World Bank's program If all three programs, the HABITAT, World Bank program, and the IDB/UNDP program, are successfully completed, the end product should be a fully functioning MPLIS

Finally, the Mayorality of Managua is issuing its own "adjudications" for small urban lots (only applicable to its own property) These adjudications may or may not have any legal authority, and are done without any geodetic survey information for the parcels

Another concern is compatibility of hardware, software, data collection standards, and mapping standards Any hardware or software purchased for use in processing and analyzing spatial information should be compatible with the equipment in the country A recurring theme in conversations with many government officials is the long term objective of putting in place a MPLIS for the whole country of Nicaragua If the MPLIS is to have full

functionality, incorporating data from multiple agencies and being of use to multiple agencies and organizations, then data collection standards must be decided upon and followed, and all data must be referenced to common control points (these points should be geodetic control points established by INETER) Also, hardware and software must be standardized in order to facilitate the integration of this system

One example of how information could be shared through the creation of an MPLIS is in the area of cadastral information For the cadastre, INETER could be made the steward of the physical cadastre It would be charged with collecting and updating information relating to parcel size and location (i e geodetic information) INETER would write this information into the system All other users (such as the registry, fiscal cadastre, etc) could read this information and print it out, but they would not be able to access and change the information Similarly, the registry would be the steward of information relating to parcel ownership They would be able to update and change this information Other agencies that need this information could read and print out the information for their own use, but they would not be able to change it Through this type of system, redundancy of information gathering and entry would be decreased, and information accuracy and speed of accessing this information would be increased

At present, the coordination that is needed to make this type of system a reality is lacking Different government agencies are collecting similar information and re-recording the information Often this information is collected to differing standards, and graphics produced from this information are produced to differing standards, making comparison and exchange of information across agencies difficult if not impossible This also means that much on-going data collection within the government is wasted Exemplifying the frustration felt by this wasted effort, the President of INETER noted that, even though many of the state agencies (such as electricity and sewage utilities) have received Integraph's Micro Station software from different donors to help them manage their facility networks, because of differing or non-existent standards, these agencies produce pretty pictures, while only INETER and INRA produce accurate maps The implementation of standardized procedures and mapping standards would go a long way to reduce this phenomenon and also to improve the efficiency and decrease the costs of many of the GON responsibilities

SECTION VII
CONCLUSIONS AND RECOMMENDATIONS

Can 100,000 urban parcels be titled in 18 months? The clear answer is no And they will not be titled in even a longer period without a more substantial investment The INETER proposal itself takes up most of the approximately US$500,000 project budget This leaves problems at the Registry and OTU unaddressed

Below are specific recommendations for action in each of the relevant institutions

A INETER

If it is decided, given all the competing interests involved in the geodetic surveying of the *barrios marginales* of Managua, that the best way to accurately survey all of the parcels in the 166 *barrios marginales* is through the use of photogrammetrically corrected aerial photographs, then INETER's proposal and the specifications laid out in their proposal are complete If a contractor is hired using these specifications, then the completed product should be adequate, in most cases, for delineation of the property boundaries on the photograph Given this, there is one specification that could be added to the technical specifications for the aerial photography contract This is the addition of a GPS receiver connected to the camera unit This would allow for the inclusion of a control point at the principle point of the photo (if the coordinates are differentially corrected)

Still, there are potential problems with choosing the photogrammetric option The two most notable are

1) Timing As was mentioned earlier, it will take at least 6 to 8 months to go through the contracting out of the project This will make it difficult to finish the geodetic surveying of all of the parcels in the 18 month timeframe, let alone, deliver titles to all of the parcels during that time frame (given the other current bottlenecks in the process)

2) Identification of parcel boundaries on the photographs The key to accurate aerial surveying is the ability to identify boundaries between parcels on the aerial photographs From our short tour of six barrios in Managua, it appears that this may not always be possible While it is true that most parcels have identifiable boundaries, in the form of walls, fences, and/or trees planted on the boundaries, it is also true that the trees, especially in the older *barrio marginales*, obscure the exact location of the boundaries from the air In cases where this is true, it will be necessary to do some

form of ground surveying in order to accurately place these boundaries on the cadastral map This limitation will decrease the effectiveness of the aerial surveying

With these concerns in mind, we would like to suggest two other options that INETER may wish to consider

I GPS Survey

This option is based on work that the Land Tenure Center has done in conjunction with the Albanian Land Privatization Project [12] In brief, this methodology consists of surveying in first order/second order control points with the use of differential GPS A GPS receiver is set up as a base station (in this case in Managua) At least one GPS receiver is used as a rover in the field With this receiver first and/or second order control points are located[13] and monumented [14] Next, traditional methods (theodolite and tape) are used to survey in the parcels from the first/second order control points

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[12] An explanation of this methodology is found in Barnes, ASPRS article, February 1995

[13]The readings taken using the rover GPS will have to be differentially corrected in order to get the level of accuracy needed to consider these as first/second order control points Differential correction of the points should be done every evening (or the next day) after the field surveying with the GPS has been done It must be done before the surveying of the parcels are carried out One warning· the accuracy of the GPS points will be contingent on the GPS surveying method used and/or the amount of readings taken by the GPS receiver at each point (i e the amount of time the receiver is located at the point) In Albania, sub-meter accuracy (+/- 50 cm) was obtained with 6 readings (30 second occupation time) using the C/A code differential positioning with carrier smoothing and advanced processing method Increased accuracy could be obtained by increasing the occupation time at each point See Barnes et al. "The Design and Comparative Evaluation of a GPS Methodology for Cadastral Surveying and Mapping in Albania." LTC Publication September 1994

[14]In the barrios in Managua it was noted that manhole covers would be ideal locations to use as first and/or second order control points as they are already on the ground in the barrios, are immovable, and can also be seen in 1:5000 scale air photos (and thus could be used as ground control points for the aerial photography - if it was flown in conjunction with the surveying or at a later date).

Comparison of the "Wisconsin Model" in Albania vs traditional titling models				
Jurisdiction	Timeframe	No of Parcels	Cost per parcel for Survey	Cost per parcel for titling
Albania	11/94 to 7/95 (10 months)	approx 72,000	$3 to $5	$1
Honduras	9/83 to 10/87 (49 months)	94,028	$120	$35 20
Ecuador	4/87 to 10/87 (6 months)	74,972	$50	$167
St Lucia	12/84 to 4/87 (29 months)	approx 52,000	$96	$39

Sources J D Stanfield update on 7/14/95 for Albania G Barnes, "A Comparative Evaluation Framework for Cadastre-Based Land Information Systems (CLIS) in Developing Countries" (Land Tenure Center Research Paper 102, 1990) for Honduras, Ecuador and St Lucia

Advantages

1) Timing Given the possible delays in starting the aerial photography, this method may be faster As soon as the GPS units are obtained and personnel are trained, the locating of control points could be started, differential corrections done, and then parcel surveying completed

2) Employment While it will take highly skilled individuals (in this case--2 individuals to lead the teams doing the GPS surveying) to identify and survey in the control points, the surveying of the parcels with traditional methods could be done by surveyors leading teams of lower skilled individuals This may be advantageous given the unemployment problems in Nicaragua

3) Better identification of parcel boundaries Given the reality of boundary obstructions due to trees along parcel boundaries, on the ground surveying can avoid these problems

4) Because immovable objects will be used as the first and second order control points, aerial photography taken at a later period can be post-facto included in the cadastral information base provided by this method

5) After using the GPS units to establish first order control points in all of the barrios, the units could be used to survey in the individual parcels concurrently with the traditional methods Carrying out the two methods concurrently could increase the speed with which the parcel surveying is done Also, a test comparing the two methods' speeds could be devised on the fly, to see if it might not be faster (and more accurate) to use GPS to geodetically survey all parcels

Disadvantages

1) Accuracy The method as used in Albania only yielded +/- 50 cm accuracy for points surveyed in using GPS This accuracy can be increased, but it will mean that occupation time of the GPS units at each point will be increased In Albania, occupation time was 30 seconds in order to get the +/- 50 cm accuracy, it has been suggested that one may need to be located at a point for between 30 - 60 minutes in order to get the +/- 5 cm that INETER considers first order accuracy This amount of time per point will decrease the speed with which the surveying can be done Given this, if 4 first order points are to be identified in each *barrio marginales*, a reasonable estimate of the time needed would be 42 days (1 5 months) If eight first order points, 84 days (3 months) However, as soon as first order points are surveyed in a *barrio marginales*, the teams using traditional methods can start to survey individual parcels within that *barrio marginales*

2) Cost A cursory examination suggests that this method will cost more per parcel (in dollar figures) than the per parcel cost of photogrammetrically surveying the parcels However, this is a rough estimate When it is considered that even with the photogrammetric surveying, a certain amount of ground surveying will need to be done in order to fill in parcels that are obscured from the air, costs may be similar in the long run A more thorough study of the cost comparisons should be done before this is considered a definitive disadvantage

II Mixed Aerial Photography and GPS Surveying

This method would be a hybrid of INETER's proposal for photogrammetrically surveying the *barrio marginales* and the GPS surveying presented above There are two scenarios from this proposal

One would be purchasing all of the GPS equipment necessary now, using the GPS receivers to locate first and second order control points in the *barrios marginales* that are identifiable from the air, and starting the process of using traditional methods to survey parcel boundaries When the contracting process is complete, procur the aerial photography and use photogrammetrical methods to delineate parcel boundaries in those *barrio marginales* not yet complete Where parcel boundaries can not be identified on the photographs, continue to use traditional methods in order to survey the boundaries

The second scenario would be to start now and use GPS receivers to identify first order ground control points in the barrios for the aerial photography Next, contract a firm for carrying out the aerial photography, procur the aerial photography and use photogrammetrical methods to delineate parcel boundaries for all of the boundaries Finally, for those parcels whose boundaries are obscurred in the photos, use traditional methods to survey the boundaries [15]

[15]It should be noted that INETER currently has aerial photography for some of Managua that was taken in 1993 This photography was taken using a recalibrated 1967 Zeiss camera that had been mounted in an aircraft from the Sandinista Air Force (the plane crashed before the whole city could be flown) If this option is chosen, INETER could start the photogrammetrical portion using these photos.

Advantages and Disadvantages of the Two Approaches			
First Scenario		Second Scenario	
Advantage	Disadvantage	Advantage	Disadvantage
Timing Because work could start right away, the surveying could be done in a more timely manner	Two methods will be used instead of one Because traditional geodetic surveying of parcels will be done before the boundaries are located photo-grammetrically, questions of methodological consistency may be raised If this option is chosen, it may be necessary to photogrammetrically delineate parcel boundaries in *barrio marginales* where surveying is already completed in order to compare the precision between the two methods being used and verify that they are comparable	Because all of the parcel boundaries that are veiwable from the air are being delineated through photogrammetric methods, issues of comparability between methods will be less critical It may still be necessary to verify comparability between the methods	Timing Because surveying work would have to wait until the aerial photography is obtained, the process of surveying parcel boundaries may be slower if this scenario is used

Recommendations·

1) If cost is the overriding concern the proposal as presented by INETER may be the best option for geodetically surveying all of the *barrio marginales*' parcel boundaries However, before this is definitively decided, a more in-depth cost analysis of all of the methods outlined above should be carried out Specifically issues of how much surveyors cost a day should be identified

2) If the timeframe is the major concern then option II, scenario 1 should be considered This hybrid method may be the best way to cover all of the bases carry out geodetic surveys of all the parcels in a timely manner, provide the other interested parties with aerial photographs of Managua and, also, provide increased employment opportunities while not expending the amount of resources that could potentially be needed to carry out option I

Other recommendations

1) In order to help INETER obtain an initial estimate of the number of parcels within the different *barrio marginales*, INETER should collect information from other government agencies that provide services within the barrios Examples of the type of information that could be available follow

From our afternoon tour of six *barrios marginales*, it appeared that the majority of the *barrio marginales* have sewers in them, electrical lines, and that many of the parcels have water lines If these utilities were put in by the Mayorality or by the utility in question, then there may be sketch maps of these lines (sewers, water lines, and electrical lines) available through the Mayorality or the utility These sketch maps could give INETER's surveyors rough estimates of the layouts of the barrios and possibly the number of parcels in each *barrio* This information could help INETER plan its surveying strategy

Information such as this could also be tied to the cadastral maps, produced by INETER, to create an MPLIS Even if the utility and Mayorality sketch maps are not currently geographically accurate, they could be digitized and known points on the digitized sketch maps could be geographically identified Then, through a process called "rubber sheeting" the maps could be brought into rough geographical accordance with the cadastral maps

2 As already noted, INETER has a Pentium PC, plotter, printer equipment, and software that can be used to create and house a computerized land information system With this project they will be obtaining more equipment, that will further increase their capacity However, it does not appear that they currently have, nor does it appear that they have requested, a tape backup system With the amount of information they have already digitized, and the amount they hope to process in the next 18 months, INETER's system should have a tape backup and backups of all of their information should be made on a daily basis Without a tape backup and the regular backing up of the system, if the hardware crashes, all of the progress made by INETER could be lost

3 A local area network (LAN) should connect all of INETER's hardware This would facilitate the creation of an MPLIS As more agencies are brought on-line the possibility of creating an inter-agency network should be investigated For a truly

functional MPLIS to be established, all of the agencies, departments and offices that deal with land information should be connected over a network

4 A GPS strategy for the country should be devised One option that INETER may want to pursue is to permanently set up a GPS base station in Managua This base could be set to permamently download the information needed for differential GPS If private surveyors invest in GPS receivers that can be used as rovers, they could then buy the information needed to differentially correct the position locations that they collect with their rovers (or INETER could provide the service) This would make GPS surveying much more accessible to the average surveyor, and could also speed up the surveying process (and potentially lower costs) in the country as a whole It would also allow INETER to recover some of the costs of the GPS base station

5 In conjunction with the previous recommendation, INETER should consider locating a GPS base station on its office's grounds A base station should not be left unguarded, where it can be damaged or stolen It should be in a secure location

6 Regarding the parcel surveying in the *barrios marginales* Currently, INETER does not survey lots in areas where the occupant is on land unsuitable for habitation (i e near waterways, roads, parks, etc) Rather than not survey these lots, INETER may wish to survey these lots, but not for titling purposes Instead, the lots would be noted on cadastral maps as in need of relocation This information would then be useful in calculating expenditures needed for relocating/evicting families from these areas This information will enable proper planning and execution of more orderly neighborhoods It will also provide health hazard and disaster prevention data

7 In carrying out future survey work in Managua, INETER should seek to continue its policy of working with local community representatives to insure that all boundaries are agreed upon Given the increased speed at which INETER hopes to work, it may need additional assistance to publicize its efforts Such communication should be tailored to and targeted at the specific community to be surveyed

8 To the extent that computer equipment is the limiting factor in processing of maps, INETER should reogranize to allow for 24 hour a day use of the computer equipment, working in shifts This would functionally triple the computer access INETER currently possesses

9 The Municipal Cadastre has had difficulties in coordinating information exchanges with INETER It is suggested that the municipal officials be given office space within the INETER facilities, and that the municipal cadastre be relocated to that office With a network established at INETER, the municipal (fiscal) cadastre would become part of the physical cadastre, thus initiating the first phases of an MPLIS

Why does INETER need such exact survey information?

Any registry system is only as good as the maps it is based on Many registry titling systems, including most of the standard, formal systems in Latin America, record the boundaries of land using north, south, east, and west coordinates [16] If property boundaries are not exactly rectangular, or if they do not exactly face north-south and east-west, this system of description of land produces gaps and overlaps This means land can be legally and formally titled twice or not at all, depending on the location of the property [17] Thus, even the formal registry systems create uncertainty of tenure in many cases simply by the way they are designed, even in the absence of fraud or negligence This makes field verification and mapping essential ingredients in any land titling program designed to reduce tenure insecurity

B PROPERTY REGISTRY

Currently, new titles to beneficiaries are being processed free of charge The World Bank has agreed with the Vice Minister of Property to make Managua its pilot project for modernization of the registry This will be an important contribution to urban tenure security However, as the timeframe for the World Bank is much longer than the UNDP urban titling initiative, other measures are needed These are detailed below

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[16] J David Stanfield, Rural Land Market Implications of Titling and Registration Programs in the Latin America and Caribbean Region 5 (1991)(Land Tenure Center Report).

[17] A similar phenomena occurs in the U S See Werner & Kratovil, *supra* note 25 at 258-9

Why not simply record titles in a parallel registry for urban low income areas?

As an alternative approach to titling land to the municipality, some have suggested "parallel registries" as a means to title land individually with lower registration costs and less bureaucracy than the standard registration system Parallel registries are lists of property recorded outside the normal registry process They often do not require many of the legal formalities, such as surveying or valuation, which increase the expenses of standard registries Hense, the strongest argument for a parallel registry is its low cost Yet these registries, by definition, are a redundancy of effort, since they "parallel" an already existing registry [18] Furthermore, parallel registries may lack official recognition and may not be of use in gaining access to credit since mortgages must be recorded in the standard registry In addition, where the parallel registry conflicts with the standard registry, the latter is likely to prevail Thus, the parallel registry gives a lower level of tenure security than standard registries and often does not provide the basic benefits of registration [19] The arguments for a parallel registry are often really arguments for reform of the standard registry, and would more appropriately be channeled to that end

1 Increasing inscriptions

Simply hiring more employees and supervisers may be the simplist way to get more titles inscribed Currently the use of employees is grossly inefficient due to the way in which titles are inscribed Hiring more workers would allow the registry to complete its tasks more

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[18] The *Instituto Nacional de Transformación Agraria* in Guatemala maintains a registry parallel to the "Registro General de la Propiedad " Unfortunately, neither registry is now efficient or cost-effective See Steven E. Hendrix, D. David Moyer & Ronald S. Strochlic, La Reforma del Registro de la Propiedad en Guatemala: Informe de Situación con Recomendaciones 22 (1992)(LAC TECH Report, University of Wisconsin Land Tenure Center)

[19] The Institute for Liberty and Democracy has created a parallel registry in Peru The ILD has titled land only in non-agricultural zones where there are fewer disputes Yet it is precisely where property is insecure that titles have their greatest impact Second, the ILD has relied on existing maps and building plans for data without field verification· the ILD inputs this data into its computerized system Yet the level of confidence in that data is low Gerhard Larsson, *Land Registration and Cadastral Systems* 105 (1991) argues that conversion of data from older registries can only be accomplished with considerable field work when the bulk of the referred land units have already been defined on maps. Not using field data means that the poor must accept a judicial process that gives them less security and fewer rights than their more affluent neighbors, who can buy into the standard, more exact registry system. A more equitable approach would be to reform the existing registry system to allow all access to the protection of the law on an equitable basis

quickly, using the same, inefficient manner it always had In this regard, this proposal is perhaps the most conservative approach

2 Streamline the *Diario*

There are several ways the *Diario* could be made more compatible with the volume of work coming through the registry The first and lowest cost option may be simply to hire more clerks Instead of just one *diario*, there could be several volumes A single date and time clock could be used to stamp entered documents with exact time down to the second, so that there would be no question over "first in time" with two entries made in different books for the same exact time

3 Radical Surgery?

It is no coincidence that guarantees of property ownership are usually one of the first provisions in national constitutions Market economies require property systems to function The registry is where those markets record transactions in real estate Consequently, change to that institution should rarely done The legal establishment is very resistant to change in property generally And we might expect it to be more resistant to change in the context of recent changes, as have been witnessed in Nicaraga over the last 15 years

Further, there is a need to coordinate closely with the World Bank The urban titling initiative should not undertake anything that will work at cross purposes with the Bank's longer term interests But now is the moment for bold thinking Action taken to improve the registry will create synergies and efficiencies that could potentially prepare the registry for even bolder actions in the near future with World Bank funding

As noted above, the World Bank and INRA appear to be doing some sort of work on diagnostics of the registry Any work done in this area must include systems analysis, data base management, administration, finance, and legal (both local, national and comparative) perspectives Without these reports in hand, we believe some diagnostic is needed immediately if the goal of 100,000 urban titles in 18 months is to be embraced as a goal Such a study will reveal all major bottlenecks and recommend concrete measures to address them It is hoped the planned studies can meet these needs

Instead of simply hiring more public employees, a much more appealing solution would be a computer database The database would provide the narrative template, and would require the clerk only to enter important fields of information, such as owner's name, date, parcel number and buyer's name Data already captured by INETER or the Fiscal Cadastre would not be duplicated Instead, a link would be set up on a "read only" basis to obtain these data directly from the proper source, saving emmense amounts of time and duplicative effort

A compromise between the conservative approach (hiring more employees) and the more radical approach (automatization) might be simply scanning in the title rather than writing out summaries This would capture all data without having to write it all out by hand

Land Registration Development Phases in the Developing World

According to Gerhard Larsson, there were four different phases in the development of land registration in non-cadastral countries[20]

1 Sporadic and voluntary deed registration Deeds had a verbal land identification There were no rules to normalize and formulate land surveying It was not organized by lot or parcel but by date as in many parts of the United States, when property insurance was added The insurance companies maintain their own maps and land surveys, Example Guyana "Transport" system, Bolivia's voluntary deed registry system [21]

2 Continuation of number 1 above except with a mandatory deed registration Example Ecuador

3 Sporadic, mandatory "title" registration That is, the land has to be registered with a land survey From that date on, each new transaction needs to be registered The registration is guaranteed and insured by the state During that phase, there are usually two types of legislation One is applicable to the Deeds Registry system, while the other is applicable to the Title Registry system (For example Land Registry Act of 1925, in England, and a Land Registry system in Guyana[22])

4 Mandatory and systematic "title" registration All land within a certain area is identified and registered

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[20] Gerhard Larsson, Land Registration and Cadastral Systems (1991) page 23

[21] Guyana Steven E Hendrix, "Land Tenure in Guyana: A Rapid Appraisal Report with Recommendations on Policy Formulation and Registry Modernization for the A.I D P.L. 480 Program" (University of Wisconsin Land Tenure Center, June 1993) page 16

[22] Guyana Steven E Hendrix, "Land Tenure in Guyana: A Rapid Appraisal Report with Recommendations on Policy Formulation and Registry Modernization for the A.I.D. P.L. 480 Program" (University of Wisconsin Land Tenure Center, June 1993) page 17.

Yet even more bold, administrative streamlining is needed In terms of streamlining the titling process at the registry, Nicaragua should examine adoption of declared registration areas This may be useful to document thousands of small parcels on a swift basis, especially in areas where parcels have traditionally been in the informal sector It would also reduce paperwork at the registry to a fraction of its current level and make title searches very simple

What are "declared registration areas"?

Declared registration areas are often used to speed up titling and reduce transaction costs, while providing a high degree of legal certainty to property ownership Many countries have antiquated registration systems Conversion to "title systems" is accomplished by declaring a particular, bounded, physical area a "declared registration area " Within this area, titles are brought up to date within the new system Outside this geographic area, real estate transactions continue as before Thus, a parcel corresponds to only one registry system, either within the declared area, or outside it Declared areas have been used in places like Belize, Trinidad, Guyana, Kenya, Cayman Islands, and Albania to allow for massive titling in short order under conventional legal systems

Title registration is very easy Reference is made to a parcel map created by the cadastral institute Documentation simply states that on a certain date a given parcel (represented by a unique parcel identification number) was transfered from seller to buyer It is that simple No publication of sale is required, and title searches can be made in minutes Further, the system gives a high degree of certainty of ownership to a single individual, making title insurance unneccessary

Since the system is predicated on cadastral maps, the achilles heel of these systems has been the lack of cadastral data Where such data exists, title registration is a preferred registration system, and declaring registration areas is the proper way to convert from older registry systems to a title system

Ideally, declared registration areas could be networked with INETER, so that parcel boundaries would be accurately described already, freeing INETER from having to duplicate that effort Automation could mean processing transactions in hours rather than years

Automation of the *Registro Social de Inmuebles* in El Salvador

Automation and streamlining of registration is very much welcome--by most users But there are losers those that benefit from inefficient, nontransparent systems, including registry employees accepting bribes, title insurance companies earning high commissions, and attorneys paid for lengthy title searches and litigation These stakeholders have an interest in seeing that automation not come to the jurisdiction El Salvador took an interesting approach to this issue

In El Salvador, the country combined automation with the *folio real*, a variation of a title based system Declared areas initially were only in low income neighborhoods, places where residents currently did not purchase any legal services The organized bar did not oppose modernization in these areas, as it represented no loss of business Within modernized declared areas, transactions then proceeded within about 2 hours, while more wealthy neighborhoods had to wait weeks and months for their transactions to emerge from the system Bankers began to favor the more agile system Currently, there is a great deal of public pressure to expand the automated system nationwide, to allow the middle class and wealthy to take advantage of the system The Salvadoran bar association has noted the increase in commercial transactions and has consequently been a strong supporter

In a similar case in Belize, from the organized bar perspective, law firms are currently carrying a very high level of potential liability for malpractice where engaged in a real estate practice in a jurisdiction with an inefficient registry Consequently, it is precisely this institution lobbying for automated registration within a title-based system This approach needs to be communicated to Bars in other countries to solicit support for registry modernization

Organizational View of the three separate Property Registration Systems Under the *Registro de la Propiedad Raíz e Hipotecas*) (RPRH) in El Salvador	
System	Comment
(1) The *folio personal*	organizes information based on the owner's name
(2) the *folio real*	organizes information based on the property or real estate involved
(3) the Social Property Registry (*Registro Social de Inmuebles*)	a computerized subset of the properties within the *folio real* system To a certain extent, the social property registry is automated and streamlined for enhanced registration capabilities Work in this section has been contracted out by the traditional registry to the *Instituto Libertad y Progreso* (ILP)

Table 3 Organizational Structure of the Registry in El Salvador

Concept of Self-Financing (*autofinancimiento*)

As the registry moves toward modernization, it should look for ways to correct the fiscal deficiency and make itself self-financing Three concerns are apparent in this effort First, Nicaragua should charge users fees appropriate to recover the costs associated with registry services But, charging for use of the system could well become a deterrent to participation in the system If so, this could lead to a return to informality In Honduras, a great deal of money was spent by international donors to promote land titling and registry reform Yet the projects were not sustainable, as participants dropped out and returned to informality, due to transactions costs Such lack of maintenance makes the original effort futile These results must be avoided if a registry modernization project is to be seriously contemplated Currently, at least first time registrations for small urban lots are now proceeding exempt from any registration fee

Second, allowing registries to retain user fees can create opportunities for corruption This may be especially problematic during the conversion phase, when money begins to come in, but the process still lacks a high degree of transparency This is no small concern in a country noted for problems in the area of rule of law and land administration

Third, perhaps the biggest problem with the self-financing proposal is its view of what the service of the registry is Emphasis on self-financing has focused on the service of parcel

transaction inscription But this in only one user of the system There is a tendency now worldwide to try to capture revenue from all system users This will include, perhaps, other governmental units and the private sector, all of whom seek geographic information on a regular basis

Comparison of Transactions at Registries in Private Lands: recorded at the Deeds Registry in Guyana

Office Section	Conveyance	Land Registry
Document Name	"Transport" or "Deed"	"Registered Title"
Historic Origin	The original Roman/Dutch System operative in Guyana Based primarily on names of the parties involved in the transaction	Australian, imported by the British to improve on the Roman/Dutch system Based on the parcel, rather than buyer or seller
Property Description requirements	Sometimes Long, verbal descriptions of land, survey plans often feature	Reference only to Block, zone and parcel number on a survey
Time requirements for transfer or mortgage	6 to 8 weeks in theory 3-6 months in practice	In theory, 1 day In practice, 2 days to 1 week
Geographical application to date	Entire Coast and banks of larger rivers	Mainly coastal with some riverain areas
Procedure	long documentation, publication in the Gazette, period for opposition, execution before the Court	Presentation at registry Almost instant registration
Cost/benefits	Does not often require elaborate survey, but process is time consuming	Process is cheap and fast, but requires up front investment in surveys by Government
Amount of documentation	extensive	minimal

Gender issues

It may also be necessary to review how titles are granted in the *barrios marginales*, and to make sure that there is participation by female heads of households as parcel boundaries are being determined by the local community representatives It may also be necessary to bring

in an expert on gender issues to identify the relevant areas where reforms may be necessary to better protect women's rights to and access to land More generally, as both the urban and rural titling initiatives get underway, care must be taken that women as well as men benefit from greater land tenure security Broader issues that should be examined are

1) Does the registry allow for land to be co-registered under both the husband and wife's name? In some Latin American countries this is not the case In those countries when a divorce takes place the woman loses all access to land that was obtained during the marriage

2) Do female heads of households have the same access to land titles as male heads of households? Again, in some Latin American countries this is not the case

3) Do inheritance laws equally allow for the inheritance of land by both the male and female offspring?

C URBAN TITLING UNIT (OTU)

The Finance Minister already has a solid handle on the OTU However, some sort of settlement on indemnization of ownership via a block solution for urban smallholers would greatly help Assistance to INETER will generate more work for OTU in terms of *solvencias*, something OTU is probably already fairly equipped to handle If addition streamlining were needed, OTU might consider additional staff for the government notary

D CROSS-CUTTING ISSUES

Given the many different entities dealing with property (Supreme Court, Department of Construction and Transport, Finance, Department of Justice), some consolidation may be in order The Vice Minister for Property has suggested that perhaps all should fall under the Finance Ministry If this is politically difficult to do, all might be located at a single location This has been done at least partially at the new OTU office

Titling is typically part of a broader registration reform process,[23] one which requires technical expertise [24] The reform process is indispensable for maintaining a modern

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[23] For example, the AID Ecuador project involves broader registration reform issues.

[24] For example, the Bar Association and the Property Registrar in Guatemala are consulting with technical experts from Costa Rica in the design of the titling reform project in Guatemala.

cadastral land information system--a database used for property taxation, zoning, and land use purposes Maintenance of property records and the land information system *over time* is crucial for an active and transparent land market In addition, land-titling and formalization efforts are useless without subsequent legal enforcement of boundaries [25] In the absence of maintenance and boundary enforcement, the entire registration and formalization process is jeopardized [26]

One of the primary goals of property registry reform is to provide a legal framework for economic markets [27] For a legal framework to inspire investor confidence, potential investors must perceive that a solid, high quality institutional basis is in place This argues for appropriate compensation for land registry employees, as well as other incentives to prevent corruption and encourage professionalism It also means that all system users should be treated equally and receive equal service This service should be delivered in a transparent fashion, meaning that the rules are clear and well-publicized, and that documents are open to public inspection Accuracy standards should never be compromised simply to demonstrate results, as this would undermine confidence in the results generated As a rule, it is never cheaper than now to make such infrastructural investments in quality In short, reform projects should "do it right the first time "

The methodology of land formalization should reflect national conditions In Honduras, for instance, a report showed that much of the property there went unregistered, despite titling efforts [28] This was due to (1) the legal restrictions on titling parcels smaller than five hectares, and (2) lingering suspicions of the government's intentions by the peasantry Interestingly, data from Honduras also show a continued use of "customary" rather than legal procedures for land transactions even after land had been titled through a titling project [29]

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[25] In Brazil, the World Bank found that subsequent to legal demarcation of the land, violations of the boundaries occurred from a variety of sources, including official acts (revocation of decrees, building of roads through reserves) and incursions into indian lands by poor colonists who themselves lacked alternatives for access to land and resources. See Alaka Wali & Shelton Davis, Land Regularization in Special Amerindian Components of Bank-Funded Projects in the LAC Region 17 (1991)(World Bank Report available from the World Bank)

[26] Gerhard Larsson, *supra* note 31 at 118.

[27] See, e g., J David Stanfield and Maksi Raço, Creation of Albanian Land Markets, 71 Land Tenure Center Newsletter 1, 3 (Spring 1994)

[28] Stanfield, Nesman, Seligson & Coles, *supra* note 7 at 34.

[29] Coles, *supra* note 26 at 32.

The method of titling should also be tailored to fit distinctive regions within a country For example, urban areas may have a higher property value, and so justify prioritization in titling In contrast, rural areas may have lower property values Therefore, as far as immediate economic impact is concerned, it may be logical to prioritize the recording of high value urban properties over less expensive ones However, equal standards may need to be applied in order not undercut the institutional credibility of the cadastral system

ANNEX
CONTACTS

During the visit, the team met with

June 27
Alvaro Herdocia, UNDP
Humberto Marín, UNDP
Leonte Lola, Secretary to Minister of Finance
Margarita Arguello Vega, Directora General, Foretalecimiento Institucional, INRA

June 28
Emilio Soto Toval, Sub-Director General, INETER
Gonzalo Medina P , Director Técnico, Dir de Geodesia y Cartografía, INETER
Pedro Miguel Vargas, Director, Geodesia y Cartografía, INETER
Leopoldo López, Vice Minister for Property, Finance Ministry
Field Visit to six neighborhoods, including various land invasions, newly titling zones, progressive urban settlements and other project areas, with INETER, directed by Manuel Gallegos
Horacio Navas Castillo, Director, Dir Catastro Fiscal, Ministerio de Finanzas, and Coordinator of the Municipal Cadastral program

June 29
Luís Angel Martínez, Registro Predial
Apolinar Guanegas López, Notario del Estado, OTU
Alvaro Contreras, Abogado, OTU
Hortencia Aldana Barcenas, Directora, OOT
Miguel Gómez, Representative, World Bank
Lic Robles, Director, National Confiscation Review Commission (CNRC)

June 30
Joe Ryan, USAID/Nicaragua
John Dorman, USAID/Nicaragua
Allan Fajardo Reina, Executive Secretary, Concertación Centroamericana de Organismos de Desarrollo
Leopoldo López, Vice Minister for Property
Leonte Lola, Secretary to the Finance Minister
Jorge Ibarra, Catastro Municipal

	César Aviles, President, INETER Gonzalo Medina, INETER Pedro Miguel Vargas, INETER
July 1	Ruth Selma Herrera, President, Instituto de Desarollo Empresarial Asociativa (IDEAS)
July 2	Brian Rudert, USAID
July 3	Eduardo Baumeister, international consultant Roger Solórzano Marín, Municipality of Managua Iván García Marenco, University of Alabama (Nicaragua campus) Bruce Cuthbertson, President, Committee to Recover Confiscated American Properties in Nicaragua Paul Trivelli, U S Embassy
July 4	Luís Raúl Cerna, Asociación Tenedores de Bonos Oscar Cerna, Asociación Tenedores de Bonos Daniel Núñez, UNAG
July 5	Antonio Lacayo, Office of the President Ernesto Leal, Chancellor John Maisto, U S Embassador Jimmy Carter (former President), Carter Center Robert Pastor, Carter Center Jennifer McCoy, Carter Center Martín Stabile, IDB Representative René Vivas, FSLN Joaquín Cuadra Chamorro, FSLN Jaime Wheelock, FSLN George Price, former Prime Minister of Belize John Strasma, Land Tenure Center
July 6	Luis Humberto Guzmán, President, National Assembly George Carner, USAID Mission Director Mark Silverman, USAID Deputy Mission Director
July 7	Ramon Daubon, DAA/LAC, USAID
July 12	Liliana Ayalde, Deputy Director for Central America, USAID

Annex

GUYANA: THE "LAND REGISTRY" TORRENS SYSTEM (LAND REGISTRY ACT (1959) AS AMENDED, CHAPTER 5 02 OF THE LAWS OF GUYANA).

Guyana is one of a number of countries with a land registry system Others include Belize, Kenya, Trinidad and Tobago, Cayman Islands, and St Lucia

This system, introduced in 1960 into Guyana is essentially registration of the land which is its main focus In comparison with the transports system with which it is concurrent, land registry transactions are much simpler There is no requirement of advertisement in the Official Gazette and a transaction of any nature may be completed, with or without the parties being in attendance at the registry, within one day

The land is identified and described as a parcel located in a block situate in a geographical zone with no need for lengthy description or reference to a land surveyor's plan Ordinarily land is brought under this system when it falls within a registration area so designated by ministerial Order Awards are made by a Commissioner of Title - judge of the Land Court - to successful applicants for title to land within such an area based on an accurate survey done by a land surveyor statutorily provided by the Commissioner of Lands and Surveys for that purpose

On the basis of the Orders made by the Land Court and transmitted to the Registrar, the first entries of land are made in the register

In respect of each parcel of land, the register provides information on ownership, area, encumbrances, judgements or caveats A caveat has the effect of a restraint imposed by an objector against future dealings with a parcel without the objector's being heard

Registered land is protected by an Assurance Fund to which contribution is made by the parties to each transaction and from which compensation may be paid to someone mistakenly dispossessed of land

Once on the register, land may not be withdrawn from it

The Act provides simple statutory forms for most of the ordinary processes like transfer on sale, mortgage, lease or caveat There forms duly completed by the parties, are presented at the Land Registry after being signed by the parties before a Notary Public, Justice of the Peace or Commissioner of Oaths in Guyana or overseas before a Notary Public or other designated Official They may also be signed before the Registrar or Assistant Registrar

Upon payment of the requisite fee, the advalorem duty and contribution to the Assurance Fund, the transaction of sale and transfer or mortgage of land may be entered into the

register in one or two days and a new Certificate of Title issued within one week to a new owner There is no requirement of advertisement and no provision for opposition as under thee transports system

Accordingly, not only is the sale and transfer of property capable of being completed in one or two days, but the raising of loans by way of mortgage may be effected in a similar period

Again, unlike the transport system the Act makes provision for registration of

a A lien obtained by lodgement of the Owner's Certificate of Title in the hands of the person holding the lien,

b A judgement of the Court or a writ of execution against the owner's property,

c A caveat by some person claiming an interest in the land

THE LAND COURT - LAND REGISTRY ACT

The Land Court is presided over by a Commissioner of Title who has the power to determine all matters regarding title to land in a declared registration area The Commissioner, upon such declaration, invites all persons having claims on whatever basis, whether by prescription, testate or intestate succession, purchase or actual ownership by a document of title to such land

A land surveyor provided by the Commissioner of Lands and Surveys prepares a preliminary or sketch plan identifying the several portions claimed and illustrating disputed boundaries

Following due publication in the Official Gazette and newspaper, the Commissioner of Title adjudicates upon the applications and makes declarations of title (or recordings of a previous title where appropriate) whereupon the surveyor prepares the final plan showing every piece of land as a parcel After due publication of these declarations the Commissioner of Title transmits to the Registrar of Lands orders under the seal of the Land Court upon the basis of which the Registrar opens a land Register for the particular area The land is now "registered land" for all purposes and all time and may in future be dealt with only under the provisions of the Land Registry Act

Junio, 1995

MINISTERIO DE FINANZAS

OFICINA DE TITULACION URBANA

ESTADISTICAS CONSOLIDADAS

Nº DE BARRIOS	EN DOMINIO DE
23	EL ESTADO Y SUS INSTITUCIONES
54	PARTICULARES
10	EL ESTADO Y SUS INSTITUCIONES Y PARTICULARES

TOTAL: 87

58

CUADRO No 1

INSTITUTO NICARAGUENSE DE REFORMA AGRARIA

CONSOLIDADO DEL PROCESO DE TITULACION EN EL SECTOR AGRARIO
RESULTADOS DEL PROCESO DE TITULACION POR MACRO REGION Y DEPARTAMENTO HASTA MAYO DE 1995

MACRO REGION DEPARTAMENTOS	No FINCAS	% fincas	No TITULOS	% titulos	AREA ENTREGADA MZS	% area	BENEFIC DIRECTOS HOMB	MUJ	TOTAL	% ben dir	BENEF INDIR
PACIFICO	**110**	**19 82**	**1095**	**10 06**	**31416**	**8 82**	**2197**	**672**	**2869**	**17 51**	**11389**
LEON	29	5 23	305	2 80	9,942	2 79	361	112	473	2 89	2,131
MANAGUA	21	3 78	80	0 74	5,996	1 68	211	41	252	1 54	778
CHINANDEGA	18	3 24	121	1 11	4,356	1 22	482	144	626	3 82	2,711
RIVAS	24	4 32	441	4 05	7,593	2 13	729	283	1,012	6 18	3,693
CARAZO	5	0 90	97	0 89	580	0 16	107	6	113	0 69	466
GRANADA	13	2 34	51	0 47	2,949	0 83	307	86	393	2 40	1 610
CENTRAL	**415**	**74 77**	**7604**	**69 89**	**217066**	**60 96**	**9323**	**1655**	**10978**	**67 01**	**35643**
NUEVA SEGOVIA	183	32 97	1,810	16 64	33,067	9 29	2 293	402	2,695	16 45	9,754
MATAGALPA	72	12 97	2,005	18 43	62,590	17 58	2 180	378	2,558	15 61	7,862
ESTELI	7	1 26	159	1 46	3,465	0 97	163	7	170	1 04	349
JINOTEGA	42	7 57	1,006	9 25	17,648	4 96	1 582	354	1,936	11 82	6 104
CHONTALES	27	4 86	1,432	13 16	72,776	20 44	1,639	285	1 924	11 74	5,779
BOACO	41	7 39	554	5 09	18,067	5 07	636	116	752	4 59	2,412
MADRIZ	43	7 75	638	5 86	9,453	2 65	830	113	943	5 76	3 383
ATLANTICO	**30**	**5 41**	**2181**	**20 05**	**107596**	**30 22**	**2124**	**411**	**2535**	**15 47**	**6795**
RIO SAN JUAN	20	3 60	1,621	14 90	75,556	21 22	1,491	292	1,783	10 88	5,218
ZELAYA RAAN	1	0 18	235	2 16	14384	4 04	255	94	349	2 13	750
ZELAYA RAAS	9	1 62	325	2 99	17656	4 96	378	25	403	2 46	827
TOTAL NACIONAL	**555**	**100 00**	**10,880**	**100 00**	**356,078**	**100 00**	**13,644**	**2,738**	**16,382**	**100 00**	**53,827**

02-06-95
ELABORACION ASESORIA INRA
FUENTES DIRECCION GENERAL JURIDICA
DIRECCION DE PLANIFICACION

INSTITUTO NICARAGUENSE DE REFORMA AGRARIA

SINTESIS

PROGRAMA NACIONAL DE CATASTRO TITULACION Y REGISTRO DE LA PROPIEDAD AGRARIA

MANAGUA, NOVIEMBRE DE 1994

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CONTENIDO

I	ANTECEDENTES DEL PROGRAMA
II	DESCRIPCION Y COMPONENTES DEL PNCTR
III	OBJETIVOS DEL PNCTR
IV	METAS DEL PNCTR
V	DINAMICA ORGANICA DEL PNCTR
VI	COSTOS DEL PNCTR
VII	ORGANIZACION DE LA EJECUCION DEL PNCTR
ANEXO 1	METAS DEL SUBCOMPONENTE DE TITULACION DEL PNCTR POR DEPARTAMENTO Y POR REGION

I ANTECEDENTES DEL PROGRAMA

El proceso de reforma agraria en Nicaragua ha producido profundas transformaciones en la estructura de tenencia de la tierra En efecto, mientras hasta el año de 1978 la gran producción privada controlaba mas de la mitad del área en fincas del país y en particular los propietarios de fincas mayores de 500 Mz tenian control de un 36% del area total en fincas, en 1993 la gran producción privada controla el 21% del area en fincas y el sector de propietarios de fincas mayores de 500 MZ ha bajado su participación a aproximadamente un 8% del área total en fincas

En este importante espacio creado por la reforma agraria, consecuentemente, ha emergido el sector reformado el cual controla en la actualidad el 35% del área en fincas del pais En el sector reformado aproximadamente el 60% de la tierra se encuentra en manos del sector cooperativo y la tierra restante la poseen beneficiarios individuales de la reforma agraria y remanentes de las empresas del area de propiedad del Estado

A partir de lo anterior se puede asegurar que el proceso de reforma agraria iniciado en 1979, propicio la ejecución de un masivo proceso de redistribución de tierra dirijido fundamentalmente hacia los sectores mas pobres del campesinado y a partir de las acciones del gobierno actual a demandantes de tierra priorizados constituidos por miembros de la ex-resistencia nicaraguense, licenciados del EPS y campesinos tradicionales principalmente localizados en las regiones del centro interior del país

Estadisticas del INRA indican que el proceso de reforma agraria ha distribuido, hasta el presente, alrededor de 2 9 millones de Mz , de las cuales, 1 7 millones corresponden al sector cooperativo, 1 millon a asignaciones individuales y 200 mil a remanentes de empresas de reforma agraria o area estatal en proceso de privatización

A partir de Abril de 1990, el Gobierno de la Presidente Chamorro ha completado el proceso de entrega de tierras redistribuyendo 701 500 Mzs para el beneficio de 24 542 grupos familiares campesinos El fondo de tierras utilizado para estas entregas ha estado constituido básicamente por propiedades del area estatal (APP) y fueron realizadas por el INRA, CORNAP, Comisión Nacional Agraria,y Ministerio de Gobernación, en esta distribución se priorizó a los demandantes de tierra de los desmovilizados de la ex-resistencia, retirados del ejercito y gobernacion, demandantes tradicionales y campesinos repatriados

Sin embargo pese a ese masivo proceso de distribución de tierra aun no se ha logrado consolidar el cambio agrario ya que esta redistribución de la tierra no se efectuó sobre la base de ejecutar todas las acciones necesarias desde el punto de vista legal que dieran seguridad y estabilidad jurídica sobre las tierras entregadas a los beneficiarios de la reforma agraria

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Esta situación se presenta en el momento actual como uno de los problemas mas importantes del sector agropecuario en terminos de su estabilidad ya que la inseguridad jurídica sobre la tenencia de la tierra hace practicamente imposible la ejecución de planes de recuperación y desarrollo del sector agropecuario

De acuerdo al diagnostico realizado en el marco estratégico de reforma agraria, hasta 1988 se expropiaron 1,518 propiedades con un total de 890,687 mzs y se confiscaron 1 5 millones de mzs , sin embargo, el proceso involucro la titulación de más de cerca de 3 millones de mzs con alrededor de 120,000 beneficiarios Es decir, se tituló, entregando títulos de dominio tanto a beneficiarios a los cuales se les asignó tierras, como tambien se ratificó la posesión de tierras a propietarios precaristas, comunidades indígenas, etc

Ante la ausencia de sistemas de registro adecuados (ausencia de un catastro y registro actualizado) el proceso se realizó bajo minimos requisitos técnicos (medicion, levantamiento topográfico, etc) de forma que en la mayoría de los casos, las tierras tituladas no cuentan con un respaldo efectivo de la documentacion técnica pertinente

En las postrimerias de la administracion anterior y ante la inminencia del cambio de Gobierno, se realizó un apresurado, sin embargo masivo, proceso de asignación-titulacion de tierras, mediante el cual se pretendió titular y legalizar partes importantes de las tierras asignadas por la reforma agraria En efecto, durante el periodo Marzo-Abril de 1990, se titularon - entregaron cerca de 1 millón de manzanas y se emitieron alrededor de 10 000 títulos

Este proceso extraordinario de titulacion, dada su magnitud, celeridad y anomalias, lejos de contribuir a la estabilización juridica de la transformacion agraria se convirtió en un factor mas de inestabilidad e inseguridad en la propiedad agraria reformada

Por otro lado, como se expresó anteriormente, en la fase actual de la reforma agraria, se han entregado de hecho mas de 700,000 MZ cuyos beneficiarios se encuentran legalmente desprotegidos

En resumen, respecto al proceso de reforma agraria actual se puede concluir lo siguente

1 La Reforma Agraria ha provocado profundas transformaciones en la estructura de tenencia de la tierra generando un nuevo esquema de propiedad donde los pequeños y medianos productores poseen cerca del 70% de la tierra (mas de cinco millones de manzanas) (Privados y Reformados)

2 El sector reformado posee alredor de un 30% del área en finca y está constituido por las cooperativas y por pequeños productores que poseen cerca de tres millones de manzanas

3 La etapa redistributiva de la tierra concluyo con las ultimas asignaciones de tierras que realizo el Gobierno actual a través de las cuales se beneficio a más de 24,000 familias con cerca de 700,000 manzanas

4 La consolidación definitiva del sector reformado demanda con urgencia la estabilización jurídica de la propiedad reformada, ya que amplios sectores no poseen titulos sobre las propiedades que usufructan

5 La titulación definitiva de los beneficiarios de la Reforma Agraria es la principal demanda campesina, ya que la seguridad de tenencia que provee el titulo es la garantía para el crédito y condicion ineludible para que la inversion y esfuerzos de los beneficiarios, se canalice adecuadamente

Es por lo anterior que el Gobierno, en 1992, a través de sus organismos especializados y con el apoyo de organismos internacionales de financiamiento, particularmente el Banco Mundial, se planteo resolver integralmente esta situación a través de la implementación de un programa nacional de catastro, titulacion y registro de la propiedad rural (PNCTR)

En este contexto en Septiembre de 1992, el INRA en conjunto con el INETER y el Registro Público de la Propiedad de la Corte Suprema de Justicia formuló el programa nacional de catastro, titulación y registro de la propiedad Este programa que necesariamente posee un perfil de mediano y largo plazo implicara la organización y ejecución del catastro rural, la transformacion y modernizacion del registro público de la propiedad como requisitos ineludibles del proceso de estabilización y consolidacion de la propiedad mediante la emisión y/o rectificacion de titulos reales de propiedad en el sector rural

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II DESCRIPCION Y COMPONENTES DEL PNCTR

El PNCTR es un conjunto de actividades técnicas y legales articuladas e interrelacionadas, a través de las cuales se pretende estabilizar y consolidar en forma definitiva la propiedad rural, particularmente en el ámbito del sector reformado de la agricultura nacional

El PNCTR es un programa conjunto del Instituto Nicaraguense de Reforma Agraria, el Instituto Nicaraguense de Estudios Territoriales (INETER) y el Registro Público de la Corte Suprema de Nicaragua

Se trata de un programa vigoroso de titulación de tierras y de regularización de la tenencia de la tierra el cual permitirá al gobierno de Nicaragua extender la seguridad de la tenencia de la tierra a un gran número de pequeños agricultores, tambien permitira mejorar la capacidad gubernamental para titular, registrar y administrar los recursos de tierras, formular políticas sectoriales de tierras, reducir las tensiones y los conflictos sobre los derechos de la tierra y apoyar actividades económicas mediante la creación de mercados de tierras viables y seguros

EL PNCTR posee trés componentes básicos a saber

a) El catastro rural

b) La titulación y rectificación de titulos de la propiedad rural

c) El registro de los títulos nuevos a emitir y de los títulos rectificados

El eje articulador del programa es el componente de titulación y rectificacion de títulos de la propiedad reformada ya que es a través de la demanda de este componente (metas y prioridades de titulación y rectificacion titular) que se articulará la realización del catastro rural y la actualización y modernizacion del registro de la propiedad rural, no obstante la multiplicidad de usos y beneficios de estos dos instrumentos

Lo anterior significa que las prioridades de ejecución del proceso de estabilizacion de la propiedad que propugna el PNCTR se ha establecido a partir de la demanda de titulación y rectificación de la propiedad rural

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III OBJETIVOS DEL PNCTR

El programa nacional de catastro, titulación y registro de la propiedad agraria persigue los siguientes objetivos generales

Lograr a través de la ejecución del Programa la estabilizacion y seguridad jurídica en la tenencia de la tierra de todas las propiedades del sector rural

Apoyar la consolidación, estabilización y desarrollo del sector agrario en base a un proceso de ordenamiento y titulacion de la propiedad rural que dé garantia definitiva sobre la tenencia de la tierra a todos los sectores de propiedad

Propiciar y sentar las bases legales que hagan pos.ble la integración paulatina y sostenida de todo el sector agropecuario al proceso de desarrollo y crecimiento economico nacional

Cuantificar físicamente las características de todas y cada una de las propiedades para que en coordinacion con el sistema registral de la propiedad quede establecida en forma definitiva la configuración de las fincas en sus aspectos fisicos y legales

Sentar las bases para la realizacion del catastro nacional, a través de la instalación de una nueva red geodésica nacional, y la toma de fotografias aereas a nivel nacional

Proveer de nuevos ortofotomapas sobre las áreas a titular componente de titulacion

Actualizar y modernizar el Sistema Nacional de Registro Público de la Republica de Nicaragua que comprende el área de la Propiedad Inmueble, Mercantil y de Personas, que asegure a la ciudadanía en general y a los programas del gobierno la seguridad jurídica de la legalizacion de la tierra y al desarrollo socio-economico del país

Dar apoyo registral al Programa Nacional de Ordenamiento y Titulación de la Propiedad Agraria, desarrollando las actividades en las zonas priorizadas por el Instituto Nicaraguense de Reforma Agraria

IV METAS DEL PNCTR

4 1 Conceptualización de las metas, metodologia del ordenamiento y la titulación de las propiedades del sector reformado

A Concepción metológica

Previo a la presentacion de las metas del proceso de titulación y rectificación titular, y para una mejor comprension de las actividades que involucra este proceso a continuación se presenta una breve reseña de la concepción metodológica del mismo,

La ejecución del subcomponente de titulacion del PNCTR se hará sobre la base de desarrollar los siguientes pasos metodológicos

0 - Apertura de expediente de titulación

1 - La precisión de la demanda de titulacion por Departamento, Municipio y Finca Matriz

2 - El diagnostico legal de la finca matriz donde se encuentra el beneficiario Se estima que cerca de un 70% de las fincas matrices del programa (1,300) no estan a favor del Estado

2 1 Investigación registral de la finca matriz para determinar si esta a favor del Estado o de un Particular

2 2 Investigación in situ de la finca para determinar su situación real (en el terreno)(En el caso de fincas donde la Delegación no las ha visitado)

2 3 Investigacion legal para determinar si la finca está siendo reclamada y en general sobre la situacion historico-legal de la finca

3 - Legalización de las propiedades (fincas matrices) a favor del Estado

3 1 Si la finca esta siendo reclamada en la CNRC o ya pasó a la OCI, gestionar ante las instancias pertinentes el pago de la indemnizacion para posteriormente proceder a su inscripción a favor del Estado

3 2 Si la finca está en negociación (caso fincas no expropiadas y ocupadas por beneficiarios de Reforma Agraria) gestionar el pago de dichas propiedades en las instancias pertinentes

3 3 Saneamiento final de las fincas legalizadas y a favor del Estado
Proceder a sanear legalmente las fincas a traves de la ejecución de acciones legales tales como

a) Juicios de rectificación de áreas
b) Fusiones
c) Cancelación de gravámenes
d) Etc

4 - Caracterizaciones físico-técnicas de la finca matriz y socio-económicas de los beneficiarios

A traves de la primera se establece en forma aproximada la cantidad de tierra y vocación productiva de la finca matriz, incluida la existencia de infraestructura y mejoras

Las caracterizaciones socio-económicas permiten determinar el numero y calidad de los beneficiarios (y de su nucleo familiar) Así mismo a través de este estudio se determina la existencia de otros campesinos (Colonos, Precaristas, etc) que viven en el predio que no están considerados en el proceso de titulación

La información recabada sirve de base para los pasos posteriores del proceso, en particular para

a) Determinar la relación tierra-hombre en que basará la titulacion y orientar el proceso de ordenamiento en la asignación de títulos

b) Generar la base de datos para el proceso de titulacion (nombre de los beneficiarios y composicion de su nucleo familiar)

c) Sentar las bases para la realizacion del proceso topográfico (medición y deslinde de la finca)

5 - Medicion y deslinde de las propiedades (fincas matrices)

5 1 Este servicio es contratado con empresas especializadas de topografía

5 2 Supervisión de la medición y deslinde de propiedades, realizada conjuntamente por el INRA y el INETER (incluye visitas de campo y revision de planos)

6 - Completamiento del expediente de titulación y elaboración de acuerdos ministeriales de titulación

7 - Elaboración de Títulos y la programacion de entregas

8 - Entrega de los títulos de propiedad

B Las metas del componente de ordenamiento y titulación

Según la concepcion metodológica antes expuesta, el subcomponente de titulación buscara el saneamiento legal y la entrega de títulos definitivos a todos los beneficiarios del sector reformado e inclusive al resto del sector agropecuario

En términos generales el componente de titulación tiene como meta final titular y rectificar los titulos de las 2 9 millones de manzanas que se encuentran bajo la posesión del sector reformado

La primera fase del componente de Titulación esta referida a la legalización y entrega de 33,874 titulos definitivos de propiedad en un período de trés años a 36,746 cabezas de familias campesinas que poseen 1,101,659 manzanas cuya distribución indicativa macroregional se puede apreciar en el siguente cuadro

METAS DE EJECUCION DEL COMPONENTE DE ORDENAMIENTO Y TITULACION DEL PNCTR

MACRO REGION	AÑO 0 No FINC	AREA (mz)	TITULO (No)	ANO 1 No FINC	AREA (mz)	TITULO (No)	AÑO 2 No FINC	AREA (mz)	TITULO (No)	AÑO 3 No FINC	AREA (mz)	TITULO (No)	TOTAL No FINC	AREA (mz)	TITULO (No
PACIFICO	41	8 373	639	60	20 519	372	111	44 162	767	115	56 540	681	327	129 594	2 459
CENTRAL	138	104 017	3 271	199	139 283	5 724	177	150 510	5 924	265	251 607	6 642	779	645 417	21 561
ATLANTICO	7	28 032	526	24	47 477	982	28	118 106	2 118	84	833 033	6 228	143	326 648	9 854
TOTAL	186	140 422	4 436	283	207 279	7 078	316	312 778	8 809	464	441 180	13 551	1 249	1 101 659	33 874

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Un mayor detalle de las metas del subcomponente de titulación del PNCTR por Región y Departamento se puede encontrar en el anexo 1 del presente documento

Considerando que el proceso de ordenamiento y titulación comenzó en Septiembre de 1992, se ha estimado necesario establecer el año 0 del PNCTR período en el cual se incluyen todas las acciones de titulación que se llevaron a cabo hasta Diciembre de 1993 ya que formalmente el PNCTR se inicio en el último trimestre de 1993 Las acciones de titulación antes mencionadas se conceptualizan como parte del programa por dos razones, a saber a - estas acciones se enmarcan en las prioridades establecidas en el PNCTR y b - estas acciones se ajustan a la metodologia de titulacion establecida en el PNCTR

4.2 Las metas del componente de CATASTRO NACIONAL son.

Sentar las bases para catastrar 103,000 kilómetros cuadrados que actualmente no se encuentran catastrados Y actualizar los 19,000 kilometros cuadrados del Pacifico catastrado anteriormente

La prioridad para la ejecución del componente catastral se ajustara a las establecidas en el componente de titulación, es decir que el catastro proporcionará los ortofotomapas para el conjunto del área que comprende el componente de titulación, por lo tanto estos nuevos ortofotomapas cubriran 1 1 millones de manzanas

4 3 Las metas del componente Registro son.

Reforzar, actualizar y automatizar los procesos y procedimientos del sistema registral actual en los 16 departamentos del país al ritmo y de acuerdo con las necesidades del componente de titulación con énfasis en el Registro de las Propiedades Inmuebles

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V DINAMICA ORGANICA DEL PNCTR

El proceso de titulación de la propiedad rural y de rectificación de títulos del sector reformado depende de la realizacion de acciones sustantivas de catastro y registro En este sentido las relaciones básicas entre los componentes del proceso de catastro, titulación y registro son las siguentes

2 1 Relacion Titulación- Catastro

En el caso particular de la relacion catastro-titulación, su contenido formal es que toda propiedad titulada debería ser previamente catastrada, en la practica y ante la desactualización del area catastrada macroregion del Pacifico y la ausencia del catastro en las macroregiones Central y Atlántica y de acuerdo a las necesidades de titulacion que demanda el sector reformado de la agricultura, en el PNCTR la articulación catastro-titulación prevista en las siguentes etapas

Etapa I Titulación de la propiedad reformada en base al deslinde y medición topografica de los predios con estrecha supervisión catastraldel INETER Esta modalidad de titulación en base a mediciones y deslinde topografico, en el programa se considera como titulacion en base a medidas precatastrales, las que posteriormente serán ratificadas con la realización del catastro rural que seran rectificadas una ves que se realice el catastro rural

Etapa II Titulación y rectificacion titular de la propiedades del sector reformado teniendo como base técnica de medición y deslinde al Catastro rural Es decir en esta etapa primero se catastra la propiedad y posteriormente se le titula

Las prioridades en el proceso técnico de la ejecución del catastro rural, una vez realisadas las fotografia aereas, es decir para la interpretación, control fotográfico, preparación de ortofotomapas, y deslinde de propiedades, se harán de acuerdo a las prioridades del proceso de titulación cuya primera primera fase corresponde territorialmente a la macroregion central

2 2 Relación titulación-registro

El registro público de la propiedad proveerá insumos y servicios ante, durante y al final del proceso de titulacion de la propiedad reformada que son absolutamente necesarios para que este sea real y efectivo es decir para que los titulos que emita el Estado (INRA) sean títulos reales de propiedad

6'

En este sentido en el PNCTR se preveen dos ámbitos específicos de relación entre el registro público de la propiedad y el proceso de titulación de la propiedad agraria a saber

a El registro público de la propiedad como proveedor de la información registral sobre la propiedades que el Estado debera legalizar a su favor para ser posible su transferencia legal hacia beneficiarios de la reforma agraria

b El registro público de la propiedad como registrador de los títulos de la propiedad que se emitirán y de las rectificación de títulos que se realizaran

En términos generales el registro deberá apoyarla investigación registral de cerca de 800 propiedades originaria que corresponde a 1000,000 Mzs a titular en los proximos 3 años Posteriormente se debcra apoyar la investigación de registral de todas aquellas propiedades reformadas en cuyo origen la propiedad matriz no fue legalizada a favor del Estado La investigación registral se insertará en un proceso amplio sobre la situación legal de las propiedades del sector reformado que realizaran en forma conjunta el INRA y el Registro de la propiedad de la Corte Suprema de Justicia

Una vez realizadas la investigación legal y concluidos los tramites para que estas propiedades sean legalizadas a favor del Estado, el registro debera inscribir estas propiedades a su favor

Asi mismo el registro debera inscribir los titulos de propiedad que el INRA emita durante la ejecución del PNTCR

Para el caso de la rectificacion titular, el registro deberá apoyar la investigacion registral de las propiedades a rectificar y realizar la legalización de las mismas a favor del Estado Por último el registro deberá inscribir los titulos rectificados en base a la nueva información catastral del sector reformado

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VI. COSTOS DEL PNCTR

El programa cuenta con el valioso aporte financiero del Banco Mundial y en este sentido se debe señalar que en Julio recién pasado es Banco aprobó la solicitud de un préstamo sectorial para Nicaragua por alrededor de 60 millones de dólares que incluye dos componentes, uno de técnologia agropecuaria y uno de manejo y administración de tierras (PNCTR)

En este context el presupuesto del PNCTR se basa en el documento final del proyecto sectorial aprobado recientemente por el Banco Mundial

En el proyecto se establecieron montos de financiamiento por actividad para cada uno de los componentes y subcomponentes del mismo

Cabe señalar que este respaldo financiero del Banco Mundial hará posible que el INRA implemente a cabalidad su programa de ordenamiento y titulación de la propiedad reformada, que el INETER impulse el catastro rural y que la Corte Suprema de Justicia actualice y modernice el registro público de la propiedad

El monto préstamo aprobado por el Banco Mundial para el proyecto sectorial es de 57 8 millones de dólares (incluido el aporte nacional) De lo anterior 20 3 millones de dólares le corresponden al componente de tecnología agropecuaria, 30 7 millones de dólares al componente de manejo de tierras (PNCTR) y 6 9 millones a costos de la unidad de coordinación, y contingencia físicas y de precios

En el caso particular del PNCTR los recursos aprobados y su destino son los siguentes

RECURSOS FINANCIEROS PARA EL PNCTR
(en millones de dólares)

COMPONENTES	FONDOS EXTERNOS (APORTE P M)	FONDOS DE CONTRAPARTIDA (APORTE GOBIERNO)	FONDOS TOTALES
CATASTRO	11 40	1.50	12.90
TITULACION	12.20	2.50	14.70
REGISTRO	2 40	0.70	3.10
TOTAL	26.00	4.70	30.70

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En el caso particular del componente de titulación y rectificación titular la distribución del presupuesto asignado por actividad del proyecto sectorial es la siguente

Actividad	Monto millones de US$
1 Infraestructura	0.35
2 Asistencia técnica	1.40
3 Compra de vehículos	0 75
4. Compra de equipos	0 80
5 Entrenamiento	0 75
6 Proceso de adjudicación	8.10
7 Costos recurrentes	2 50
Total	14 65

VII ORGANIZACION DE LA EJECUCION DEL PNCTR

La principal responsabilidad institucional en la implementación del PNCTR le corresponde al INRA al INETER y al Registro Publico de la Propiedad de la Corte Suprema de Justicia, sin embargo la magnitud y trascendencia del programa demandan de una estrecha y efectiva coordinación interinstitucional tanto a nivel del sector público agrícola como con otras instituciones claves del sector público

La implementación del PNCTR demanda de dos niveles de coordinación interinstitucional, a saber coordinacion inter-institucional sectorial y aquella de los ejecutores directos

1 - Coordinacion interinstitucional sectorial

En el ámbito sectorial el PNCTR debe ser integrado al plan sectorial de reactivación y desarrollo sectorial El PNCTR es un prerequisito dinamico e ineludible de los planes de desarrollo del sector, ya que sin la estabilización de la tenencia de la tierra y sin seguridad jurídica sobre la propiedad rural resultarian vanos los esfuerzos por elevar en forma sostenida la producción y la productividad agropecuaria

De acuerdo a lo anterior la articulacion MAG-INRA se presenta fundamental para que los esfuerzos de ordenamiento y titulación del sector reformado se complementen con los programas de desarrollo tecnológico de la pequeña y mediana propiedad Asimismo es necesaria la coordinación IRENA-INRA para que la estabilzación del sector agropecuario y su desarrollo agroproductivo se logren en el marco de un uso racional y sostenido de los recursos naturales, esto es articularment relevante en el caso del ordenamiento y titulación de beneficiarios de la zona de frontera agrícola de trópico húmedo

La instancia idónea para impulsar esta coodinación es la CONAGRO, organo de reciente creación que tiene a su cargo el impulso del plan de desarrollo sectorial El PNCTR y su escala de priorizaciones constituye un importante aporte para establecer las metas territoriales del plan sectorial En este sentido debe quedar establecido que una política de estabilización para permanenecer en el tiempo necesariamente debe estar fundamentada en un crecimiento sostenido del producto agropecuario y en una distribución equitativa del mismo De acuerdo a lo anterior la relacion enter el PNCTR y el plan sectorial es una de complementación estratégica

2 Coordinación de los ejecutores directos

El PNCTR impulsa el desarrollo de un amplio proceso de catastro-titulación-registro de la propiedad agraria reformada Por lo anterior el impulso de este proceso exige de una estrecha coordinación entre las instancias institucionales que tienen responsabilidad directa sobre los tres componentes aludidos, es decir el INETER por su relación con el catastro y la Corte Suprema

de Justicia (CSJ) por su relación con el registro de la propiedad y ambos con el INRA por su responsabilidad en realizar el proceso de titulación de la propiedad reformada

La secuencia normal secuencial del proceso es catastro, titulación y registro, sin embargo en las condiciones particulares de Nicaragua, la falta de recursos hace imposible la implementacion inmediata del catastro rural de las regiones centrales y de la actualización de la zona catastrada (Pacífico), el INRA deberá impulsar acciones catastrales de medición y deslinde topográfico de la propiedades a titular Estas acciones ocupan un lugar destacado en la metodologia de ordenamiento y titulación que el INRA impulsará

Para hacer posible lo anterior el INRA deberá suscribir un convenio con el INETER que estara orientado a Apoyo a la definición de normas mínimas catastrales, apoyo cartográfico y de ortofotomapas sobre las áreas a titular, entrenamiento de los equipos topográficos, etc

En la misma linea apuntada se hace necesario la suscripción de un convenio entre el INRA y la Corte Suprema de Justicia orientado a apoyar el proceso de legalización de propiedades a favor del tado y de registro de los titulos de reforma agraria que durante el proceso se emitan Las actividades antes mencionadas son cruciales en el proceso de ordenamiento y titulación

El convenio entre la CSJ y el INRA debe permitir el entrenamiento y capacitación de un equipo de investigadores registrales, debe proveer de los medios financieros para que este equipo de investigadores contribuya en forma efectiva al proceso de saneamiento legal de las propiedades reformadas

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INSTITUTO NICARAGUENSE DE REFORMA AGRARIA
PROGRAMA NACIONAL DE CATASTRO TITULACION Y REGISTRO DE LA PROPIEDAD AGRARIA
METAS DEL SUBCOMPONENTE DE TITULACION POR REGION

REGION	ANO 0			ANO 1			ANO 2			ANO 3			TOTAL		
	No FINCAS	AREA	TITULO	No FINCAS	AREA	TITULO	No FINCAS	AREA	TITULO	No FINCAS	AREA	TITULO	No FINCAS	AREA	TITULO
I	55	12 476	633	29	29 982	1 544	58	43 853	1 937	97	66 453	3 464	239	152 764	7 578
II	13	2 759	274	32	13 096	250	60	12 076	440	115	56 540	681	220	84 471	1 645
IV	22	4 436	359	27	6 648	121	40	8 749	238	0	0	0	89	19 833	718
V	16	37 837	790	39	41 096	1 148	40	67 239	2 085	110	138 038	2 032	205	284 210	6 055
VI	67	53 704	1 848	131	68 205	3 032	79	39 418	1 902	58	47 116	1 146	335	208 443	7 928
RIO SAN JUAN	5	25 315	521	14	27 800	594	11	28 791	573	6	42 443	2 330	36	124 349	4 018
RAAN	0	0	0	1	12 000	240	10	48 255	921	50	71 240	2 426	61	131 495	3 587
RAAS	2	2 717	5	9	7 677	148	7	41 060	624	28	19 350	1 472	46	70 804	2 249
III	6	1 178	6	1	775	1	11	23 337	89	0	0	0	18	25 290	96
TOTAL	186	140 422	4 436	283	207 279	7 078	316	312 778	8 809	464	441 180	13 551	1 249	1 101 659	33 874

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METAS DEL SUBCOMPONENTE DE TITULACION POR DEPARTAMENTO

DEPARTAMENTOS	AÑO 0			AÑO 1			AÑO 2			AÑO 3			TOTAL PNCTR		
	No FINCAS	AREA	TITULO	No FINCAS	AREA	TITULO	No FINCAS	AREA	TITULO	No FINCAS	AREA	TITULO	No FINCAS	AREA	TITULO
MADRIZ	25	4 245	247	18	3 138	372	14	3 484	366	41	12 023	514	98	22 890	1 499
ESTELI	1	166	11	10	4 850	325	13	10 479	416	7	5 642	226	31	21 137	978
NUEVA SEGOVIA	29	8 065	375	1	21 994	847	31	29 890	1 155	49	48 788	2 724	110	108 737	5 101
CHINANDEGA	4	505	119	14	8 956	164	32	3 827	165	48	36 064	498	98	49 352	946
LEON	9	2 254	155	18	4 140	86	28	8 249	275	67	20 476	183	122	35 119	699
MASAYA				6	351	32	12	857	35	0	0	0	18	1 208	67
GRANADA	5	1 213	14	9	1 054	31	9	3 477	32	0	0	0	23	5 744	77
CARAZO	5	580	97	5	1 746	16	6	946	12	0	0	0	16	3 272	125
RIVAS	12	2 643	248	7	3 497	42	13	3 469	159	0	0	0	32	9 609	449
BOACO	8	4 779	139	25	12 056	514	19	17 817	346	75	28 232	524	127	62 884	1 523
CHONTALES	8	33 058	651	14	29 040	634	21	49 422	1 739	35	109 806	1 508	78	221 326	4 532
MATAGALPA	48	42 348	1 256	69	47 677	1 524	27	22 435	629	58	47 116	1 146	202	159 576	4 555
JINOTEGA	19	11 356	592	62	20 528	1 508	52	16 983	1 273	0	0	0	133	48 867	3 373
RIO SAN JUAN	5	25 315	521	14	27 800	594	11	28 791	573	6	42 443	2 330	36	124 349	4 018
RAAN				1	12 000	240	10	48 255	921	50	71 240	2 426	61	131 495	3 587
RAAS	2	2 717	5	9	7 677	148	7	41 060	624	28	19 350	1 472	46	70 804	2 249
MANAGUA	6	1 178	6	1	775	1	11	23 337	89	0	0	0	18	25 290	96
TOTAL	186	140 422	4 436	283	207 279	7 078	316	312 778	8 809	464	441 180	13 551	1 249	1 101 659	33 874

PROYECTO
LEVANTAMIENTO CATASTRAL
DE URBANIZACIONES PROGRESIVAS

UNIDAD EJECUTORA Dirección de Geodesia y Cartografía

INETER

Managua Mayo 1995

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I INTRODUCCION

Para llevar a cabo el Proyecto de Urbanizaciones Progresivas, distribuidas en diferentes ciudades del pais, cuyo objetivo es el Catastro de propiedades urbanas, su ordenamiento y legalizacion, el Instituto Nicaraguense de Estudios Territoriales (INETER), a traves de la Direccion de Geodesia y Cartografia llevara a cabo la elaboracion de las constancias catastrales que serviran de base para el proceso de legalizacion de las urbanizaciones independientemente del metodo que se escoja para la elaboracion de los mapas catastrales urbanos escala 1 1000

El Ministerio de Finanzas (MIFIN) a traves de la oficina de Titulacion Urbana (OTU) tiene la responsabilidad de desarrollar el componente de legalizacion, con la emision de las escrituras de las parcelas que conforman dichas urbanizaciones

El total de parcelas a las que se les debera extender documentos catastrales es de 81,588, pero el total de parcelas fisicas objeto del levantamiento topografico es del orden de 120,000, debido a que no siempre las parcelas no legalizadas se encuentran agrupadas de forma continua En Managua se concentra el 62% de parcelas no legalizadas, existiendo un total de 78,000 parcelas fisicas objeto de mapificacion.

El tiempo necesario para llevar a cabo este trabajo es de tres años dividido en tres etapas, cada una de 7 meses La primera etapa abarca de junio-dic 95 concentrando la mayor cantidad de trabajo en la ciudad de Managua y el total de parcelas medidas y documentadas sera de 48,000

II OBJETIVO

Realizar levantamientos topogeodesicos y catastrales de los Repartos o Urbanizaciones Progresivas existentes en el pais

Suministrar informacion basica necesaria para el ordenamiento y legalizacion de la propiedad inmueble a nivel nacional

Creacion y actualizacion de los mapas y documentos catastrales en las areas correspondientes para el control y mantenimiento de la tenencia de la tierra

Incorporar a la base de datos del Catastro de INETER los datos obtenidos durante la ejecucion del presente proyecto

III ALCANCE DEL PROYECTO

Elaboracion de mapas catastrales urbanos a escala 1 1,000 de los repartos o urbanizaciones progresivas, incluyendo un plano del perimetro del reparto Los mapas catastrales contendran un conjunto de parcelas fisicas con numeracion catastral, ademas de la informacion complementaria en documentos catastrales (constancias catastrales, fichas de linderos)

IV ALTERNATIVAS

Los trabajos de actualizacion de los mapas catastrales con los datos de las urbanizaciones progresivas, daran como resultado la emision de constancias catastrales con el objeto de legalizar la tenencia de la tierra

Entre los diferentes metodos para llevar a cabo los trabajos arriba mencionados se presentan tres alternativas haciendo participar en todas ellas fuerza de trabajo ajena a Ineter y de la misma Institucion En las dos primeras alternativas el grueso de los trabajos hasta llegar al plano por reparto sera efectuada bajo contrato por empresas privadas Ineter se hara

cargo de la supervision y procesamiento para obtener los productos finales necesario para la legalizacion de la tenencia de la tierra

La alternativa N° 3 a diferencia de las dos que le anteceden , requiere la utilizacion de fotografías aereas recientes de la ciudad de Managua que dicho sea de paso alberga el mayor porcentaje de repartos progresivos

Utilizando fotografías aereas el trabajo de campo disminuye debido a que el levantamiento de las parcelas de los repartos se lleva a cabo por simple fotointerpretacion y solo sera necesario establecer puntos de control GPS para la orientacion absoluta de los planos obtenidos a partir de las fotografías aereas

Alternativa N° 1

El levantamiento topografico(referido a la red geodesica nacional) de los repartos sera objeto de contratos con empresas privadas quienes llevaran los trabajos hasta el mapa del reparto a la escala 1 1000 ademas del levantamiento de la informacion catastral La relacion contractual sera directa Mifin-empresa Ineter efectuara la supervision de los trabajos de campo asi mismo se proporcionara la informacion geodesica necesaria que los contratistas requieran El procesamiento catastral para la obtencion de las constancias catastrales y la incorporacion de los repartos a los mapas catastrales con tecnicas convencionales, sera efectuada por Ineter

CRONOGRAMA

ACTIVIDADES	Junio	Julio	Agosto	Sept	Oct	Nov	Dic	COSTOS
Levantamiento topografico								7,680 000[1]
Supervision								445 05[2]
Cartografia catastral								178 25[3]
Procesamiento catastral								258 75[4]
							Total	**8,562 050**

* Miles de Cordobas

1 De acuerdo a los registros de licencias catastrales que lleva el dpto de Catastro de Ineter es problable que en el pais existan cerca de 20 empresas tecnicamente calificadas para la realizacion de este tipo de trabajo con capacidad hasta de 400 parcelas /mes levantadas y dibujadas El costo promedio por parcela es de C$160 00

2 Elaboracion de los terminos de referencia para los trabajos de campo, supervision de este trabajo y revision de los planos preparados por los contratistas

3 Traslado de los planos de cada repartos a los mapas catastrales, mediante dibujo convencional, utilizando 4 dibujantes

4 Proceso de base de datos de la cual se obtendran las constancias catastrales y fichas de lindero requiriendo para este trabajo de 6 tecnicos especilizados

Nota La parte de este trabajo que corresponde a Ineter, requiere de la participacion de 20 personas 15 de estas se desempeñan actualmente en el area de geodesia y cartografia de Ineter, el resto debera ser contratado

VENTAJAS

1 Generacion de empleos en el sector privado

DESVENTAJAS

1 Altos costos de operacion de campo

2 Distrae fuerza de trabajo de Ineter

3 No hay avance en el desarrollo tecnologico de Ineter

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Alternativa N° 2

El levantamiento topografico(referido a la red geodesica nacional) de los repartos sera objeto de contratos con empresas privadas quienes llevaran los trabajos hasta el mapa del reparto a la escala 1 1000, ademas del levantamiento de la informacion catastral La relacion contractual sera directa Mifin-empresa Ineter efectuara la supervision de los trabajos de campo asi mismo se proporcionara la informacion geodesica necesaria que los contratistas requieran El procesamiento catastral para la obtencion de las constancias catastrales y la incorporacion de los repartos a los mapas catastrales estara basado en sistemas de cartografia digital, a partir de base de datos espaciales y no espaciales obtenida de la informacion proveida por los contrastistas

CRONOGRAMA

ACTIVIDADES	Junio	Julio	Agosto	Sept	Oct	Nov	Dic	COSTOS
Levantamiento topografico								7,680 000[1]
Supervision								280 600[2]
Cartografia digital y procesamiento de datos								595 125[3]
							Total	**8.555 725**

* Miles de Cordobas

1 De acuerdo a los registros de licencias catastrales que lleva el dpto de Catastro de Ineter es problable que en el pais existan cerca de 20 empresas tecnicamente calificadas para la realizacion de este tipo de trabajo con capacidad hasta de 400 parcelas /mes, levantadas y dibujadas El costo promedio por parcela es de C$160 00

2 Elaboracion de los terminos de referencia para los trabajos de campo, supervision de este trabajo y enlace con el sistema de cartografia digital

3 Procesamiento grafico y numerico de la cartografia digital para los levantamiento de los repartos, hasta obtener los documentos catastrales finales utilizando para tal fin 6 personas Se incluye tambien la adquisicion del equipo informatico necesario

Nota La parte de este trabajo que corresponde a Ineter, requiere de la participacion de 10 personas 6 de estas se desempeñan actualmente en el area de geodesia y cartografia de Ineter, el resto debera ser contratado

VENTAJAS

1 Generacion de empleos en el sector privado

2 Avance en el desarrollo tecnologico de Ineter

3 Fuerza de trabajo de Ineter al minimo

DESVENTAJAS

1 Altos costos de operacion de campo

Alternativa N° 3

La medicion de las parcelas de los repartos referidos a un sistema de coodenadas (sistema nacional de coodenadas) sera efectuada con la participacion de empresas privadas e Ineter, utilizando fotografías aereas recientes de la ciudad de Managua En el caso de otras ciudades no cubiertas con fotografías aereas se utilizara un sistema de observacion con GPS con medicion directa y digital con personal de Ineter, asi mismo el procesamiento catastral para la obtencion de las constancias catastrales y la actualizacion de los mapas catastrales estara basado en sistemas de cartografía digital, a partir de base de datos espaciales y no espaciales obtenida de los trabajos de campo efectuados por los contrastistas

CRONOGRAMA

ACTIVIDADES	Junio	Julio	Agosto	Sept	Oct	Nov	Dic	COSTOS
Aerofotografia y delineacion								3,255 360[1]
Supervision								280 600[2]
Geodesia								531 033[3]
Fotogrametria								161 000[4]
Cartografia digital y procesamiento de datos								595 125[5]
							Total	4,823 118

* Miles de Cordobas

1 Esta parte que corresponde al sector privado, incluye ademas de la toma de fotografias aereas, los trabajos de delineacion de campo y levantamiento de la informacion catastral, estimando la fuerza de trabajo en 3,200 d x H para una cobertura de 48,000 parcelas

2 Elaboracion de los terminos de referencia para los trabajos de campo, supervision de este trabajo y enlace con el sistema de cartografía digital

3 Control Geodesico con GPS para la referenciacion absoluta de la delineacion Incluye la adquisicion de los receptores GPS

4 Trabajos de laboratorio aerofotografico base para los levantamiento mediante la delineacion de campo

5 Procesamiento grafico y numerico de la cartografía digital para los levantamiento de los repartos, hasta obtener los documentos catastrales finales, utilizando para tal fin 4 personas Se incluve tambien la adquisicion del equipo informatico necesario

Nota La parte de este trabajo que corresponde a Ineter, requiere de la participacion de 15 personas 11 de estas se desempeñan actualmente en el area de geodesia y cartografía de Ineter, el resto debera ser contratado

VENTAJAS

1 Bajos costo de operacion

2 Avance en el desarrollo tecnologico de Ineter

3 Generacion de empleos en el sector privado

DESVENTAJAS

1 Limitacion por falta de recursos Humanos con experiencia en el manejo y administracion de cartografia digital

La medicion de las parcelas de los repartos referidos a un sistema de coodenadas (sistema nacional de coodenadas) sera efectuada con la participacion de empresas privadas e INETER utilizando fotografías aereas recientes de la ciudad de Managua En el caso de otras ciudades no cubiertas con fotografías aereas, se utilizara un sistema de observacion con GPS con medicion directa y digital con personal de Ineter, asi mismo el procesamiento catastral para la obtencion de las constancias catastrales y la actualizacion de los mapas catastrales estara basado en sistemas de cartografía digital, a partir de base de datos espaciales y no espaciales obtenida de los trabajos de campo efectuados por los contrastistas

CRONOGRAMA

ACTIVIDADES	Junio	Julio	Agosto	Sept	Oct	Nov	Dic	COSTOS
Aerofotografia								600,000 00[1]
Delineacion								660 000 00[2]
Supervision								280 600 00[3]
Geodesia								531,033 00[4]
Fotogrametria								161,000 00[5]
Cartografia digital y procesamiento de datos								595,125 00[6]
							Total	**2,827,758 00**

1 Valor de la toma aerofotografica que sera llevada a cabo por empresas especialistas en el ramo las cuales ofertaran de acuerdo a las especificaciones tecnicas establecidas por INETER

2 Esta parte que corresponde al sector privado, incluye los trabajos de delineacion de campo y levantamiento de la informacion catastral, estimando la fuerza de trabajo en 2 000 d x H para una cobertura de 30,000 parcelas

3 Elaboracion de los terminos de referencia para los trabajos de campo, supervision de este trabajo y enlace con el sistema de cartografía digital

4 Control Geodesico con GPS para la referenciacion absoluta de la delineacion Incluve la adquisicion de los receptores GPS

5 Trabajos de laboratorio aerofotografico, base para los levantamiento mediante la delineacion de campo

6 Procesamiento grafico y numerico de la cartografía digital para los levantamiento de los repartos, hasta obtener los documentos catastrales finales, utilizando para tal fin 4 personas Se incluye tambien la adquisicion del equipo informatico necesario

Nota La parte de este trabajo que corresponde a Ineter requiere de la participacion de 15 personas 11 de estas se desempeñan actualmente en el area de geodesia y cartografia de Ineter el resto debera ser contratado

OBSERVACIONES

1 La adquisicion inmediata de los equipos garantizara el cumplimiento del proyecto de acuerdo a lo planificado

2 Los equipos a adquirir tendran que ser necesariamente tecnologia de INTERGRAHP debido a que seran complemento de los equipos existentes en INETER

3 Garantizar un desembolso inicial al menos de un 30% del valor total del proyecto para el proceso de instalacion y adquisicion de equipos de cartografia digital y geodesia

ESPECIFICACIONES TECNICAS
VUELO AEROFOTOGRAFICO DE LA CIUDAD DE MANAGUA

ESCALA: 1:5,000
AREA: 312.5 Km2

ESPECIFICACIONES TECNICAS

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ESPECIFICACIONES TECNICAS

A. VUELO AEROFOTOGRAFICO

I - Objeto del Vuelo Aerofotografico

1 1 El vuelo aerofotografico tiene por objeto la cobertura estereoscopica por pasajes rectilineos y paralelos de fotografias verticales de la zona a levantar, cuyos limites seran las lineas establecidas en los mapas adjuntos

1 2 La navegacion de los vuelos aerofotograficos debera ser realizada utilizando un sistema de navegacion G P S especial para vuelos fotograficos como CCNS4,ESCOT o T-FLITE ofreciendo las posibilidades siguientes

- Navegacion de alta precision (mejor de ± 100 metros de desviacion desde la pasada planificada en los mapas respectivos)

- Posibilidad de disparar las fotos pricisamente a las posiciones predeterminadas (mejor de ± 100 metros)

- Calculo automatico de la deriva y de la (velocidad/altura)

- Registro automatico de las posiciones de cada foto

1 3 G P S cinematico Para ahorrar puntos de control terrestre y para mejorar la precision de los resultados de la aerotriangulacion, el contratista tiene que prever el uso de un sistema de G P S cinematico utilizando un receptor G P S del tipo Geodesico (ASHTECH XII, TRIMBLE 4000SSE o similar) Aparte del receptor G P S usado en el avion, se tiene que instalar otro equipo G P S del mismo tipo en tierra para la observacion simultanea Esta instalacion se tiene que coordinar anteriormente del vuelo con el contratante

2 - Escalas de las Fotos Aereas

2 1 Las fotografias aereas tendran una escala de 1 5000 Las variaciones de escala no deberan ser menores de 1 5500 ni mayores de 1 4000

B CONDICIONES DEL VUELO FOTOGRAFICO

3 - Lineas de Vuelo Fotografico

3 1 El area a fotografiar sera de 312 5 km2 de la ciudad de Managua Capital de la Republica de Nicaragua

3 2 Deberan cumplir las siguientes condiciones

- Las fotografias deben ser verticales de tal manera que los ejes opticos de las exposiciones consecutivas no formaran en ningun caso angulos superiores a 3 grados sexagesimales

- Los ejes de dos fotografías de numero de orden n y n+2 no formaran agulo superior a 3 grados sexagesimales

- La deriva no debe exceder 5 grados (sexagesimales) cuando se mide entre la linea base de la direccion especificada en el plan de vuelo y una linea paralela al marco de la fotografía

- Las lineas de vuelo se separaran con una o mas exposiciones en blanco Los centros de la primera y ultima exposicion de cada linea de vuelo quedaran mas alla de los limites del proyecto Las lineas de vuelo ultra marginales se haran de modo que al menos el 15% de cada exposicion quede fuera de los límites del proyecto

4.- Cubrimiento de las areas a fotografiar:

El vuelo fotografico debera extenderse mas alla del area del proyecto por lo menos dos fotografías a fin de garantizar un cubrimiento estereoscopico completo

4 1 Las lineas de vuelo no deberan interrumpirse, en caso de que esto llege a ocurrir, la continuacion de la linea se llevara a cabo tomando como un minimo dos fotos anteriores a la ultima foto donde se origino el corte, de modo que se asegure la continuidad de la linea y por lo menos un par estereoscopico El vuelo fotografico debera apagarse exactamente a la posicion de las lineas del plan de vuelo

4 2 El recubrimiento longitudinal debe ser del 60% y el recubrimiento lateral debera ser del 30%

4 3 Cuando el pasaje cruce una linea costera (o zona cubierta por agua de extension muy importante con respecto al formato) perpendicular u oblicuamente a ella, el recubrimiento longitudinal debe incrementarse al maximo posible que permitan las caracteristicas de las camaras, tratando de alcanzar un recubrimiento del 90%

5 - Horario y Circunstancia de Vuelo

5 1 Los vuelos seran realizados en horas tempranas del dia, la fotografía debe tomarse cuando el sol se encuentra con una inclinacion mayor de 30 grados con respecto al horizonte y estas no deben presentar puntos brillantes debido a reflexiones especulares del sol (HOT SPOT)

5 2 La fotografía debe estar libre de nubes, sombras de nubes y humo, sin embargo pequeñs nubes aisladas (menos del 5% del area de la fotografia) no seran causa de rechazo de la linea

5 3 Los rios, lagos y otras masas de aguas deben encontrarse en sus cauces normales durante el monento de exposicion

5 4 La velocidad de vuelo sera tal que, combinada con la duracion de exposicion y altura de vuelo, asegure un desplazamiento de imagen (debido al movimiento del avion durante el momento de exposicion) menor de 0 01 milimetros o bien se utilizara una camara que compense automaticamante este desplazamiento

6 - Altura de Vuelo

6 1 Sera tal que permita la obtencion de las fotografias con una distancia focal de 153 mm y una escala de foto 1 5000

C CONDICIONES TECNICAS DE LA CAMARA FOTOGRAFICA

7 - Tipo de Cámara a Utilizar

7 1 Se utilizara una camara fotogrametrica de precision, dotada de los dispositivos necesarios para la correcta exposicion de las fotografias aereas

8 - Tipo y Tamaño

8 1 Se deberan utilizar camaras metricas de formato 23 x 23 cm equipadas con cono gran angular, distancia focal nominal de 153 mm Las camaras deben ser de ultimo modelo como (Zeiss RMK TOP o WILD RC30), ofreciendo una señal precisa del momento de la exposicion(para G P S cinematico) y la posibilidad del registro inmediato de las coordenadas de las fotos en la leyenda de la camara La camara tiene que tener el sistema FMC (Forward Motion Compensation) para evitar el movimiento de la imagen

9 - Documentacion de la Camara

9 1 Calibrado Las camaras aereas (incluyendo cono y filtro), deben haber sido calibradas dentro de un lapso no mayor a dos años

9 2 El certificado de calibracion debe presentarse en original y una copia para verificacion y debe contener entre otros datos, los siguientes

(a) Nombre de la institucion que avala el certificado de calibracion

(b) Fecha de calibracion

(c) Nombre del fabricante y tipo de camara

(d) Numero de serie de la lente y placa de registro

(e) La distancia principal o distancia focal calibrada de la lente

(f) La distorsion radial referida al eje de optima simetria

(g) Las distancias entre marcas fiduciales, tanto lateral como diagonalmente

(h) Posicion del punto principal de autocolimacion, con respecto al centro fiducial

10 - Criterios y Condiciones que debe reunir la camara

10 1 La camara y sus accesorios deberan satisfacer los siguientes criterios y condiciones

a) Tal como se indica en el Informe de Calibracion, la Resolucion Media Ponderada del area (AWAR), medida en placas Espectroscopicas, tipo V - F, con una abertura maxima, excedera 55 lineas por milimetro

b) Tal como se indica en el Informe de Calibracion, el valor absoluto de distorsion radial medido con una abertura maxima no excedera 10 micrones

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c) Si se especifica una camara con ocho marcas fiduciales, o con un reseau interno o externo, estos datos tambien se calibraran y se incluiran en el certificado de calibracion de la camara

d) Las lineas que unen los pares opuestos de marcas fiduciales se intersectaran a un angulo de 90 grados sexagesimales

e) La intersecion de lineas entre las marcas fiduciales y el centro fiducial no quedara mas alla de 0 030 milimetros del punto de autocolimacion

f) El punto principal calibrado - el punto de simetria - no quedara mas alla de 0 030 milimetros del punto de autocolimacion y el centro fiducial

g) La placa de presion del almacen no diferira del plano verdadero por mas de 0 013 milimetros

h) La camara debera tener un obturador entre los lentes de velocidad variable El obturador debera tener una eficacia minima de 70% a una velocidad de 1/200 de segundo medida con una abertura maxima

i) Solamente se podran utilizar filtros recomendados por la casa fabricante de la camara Se utilizara un filtro amarillo o " menos azul" que bloqueara los rayos solares de menos de 525 nanometros(± 25 nanometros) en longitud de onda El filtro usado tendra una transmision de aproximadamente 100% con respecto a la luz visible mayor de 525 nanometros

j) Se usara el filtro de cristal especificado revestido con una capa metalica antivinetada La superficie emulsionada debera estar hacia el lente de la camara El filtro debera tener superficies dentro de 10 segundos de arco verificados por el certificado de calibracion de la camara El filtro debera tener una calidad optica que distribuya la luz uniformemente sobre el plano focal y que no cause degradacion en la resolucion

k) Las camaras provistas de marcas fiduciales cruciformes interrumpidas deberan tener un punto en el centro de la marca cruciforme

l) Cualquier desmontaje o remontaje de la camara aerea que afecte a las constantes de calibracion necesitara una recalibracion

m) Si en el avion se usa un vidrio comun de camara, este debera tener superficies paralelas dentro de 4 segundos de arco en una longitud de prueba de 6 35 centimetros (2 5 pulgadas) El vidrio de grupo "M" es un ejemplo aceptable

n) Todas las marcas fiduciales y otras marcas utilizadas para mediciones precisas deberan ser claras, bien definidas y bien enfocadas en los negativos aereos La desviacion estandar de lecturas repetidas de las coordenadas de cada marca efectuada en un comparador no debera exceder los 0 002 milimetros

D CONDICIONES TECNICAS DE LAS FOTOGRAFIAS

11 - Escala de las fotografias

11 1 La escala de las fotografias en los lugares de cota media de cada linea de vuelo es la fijada en el objeto del contrato

12 - Verticalidad

12 1 La distancia nadiral de cada fotografia sera siempre inferior a 3 grados sexagesimales, rechzandose cuando el 6% de las fotografias no cumplan esa condicion o exista alguna fotografia cuya distancia nadiral supere los 4 grados sexagesimales

13 - Información Complementaria

13 1 Las fotografías llevaran las referencias en el margen para su identificacion y caracteristicas que las definen Estas son

* Nombre del Contratista
* Fecha de toma (dia, mes, año)
* Escala media cuando menos al inicio y termino de la linea
* Numero de rollo
* Numero de la linea
* Numero de fotografia
* Distancia focal de la camara
* Nombre de la compañia que efectuo el vuelo
* Indicador del altimetro
* Imagen del nivel esferico

Las anotaciones se haran con tinta de tipo permanente

Ningun rollo de pelicula debe cortarse aun en el caso de que existan fotografías que esten fuera de especificaciones

14 - Normas de calidad de la pelicula original

14 1 La pelicula se expondra y se revelara bajo condiciones sensitometricas controladas a fin de que contenga todos los detalles de blancos y sombras Se expondra un cuña calibrada de grises en por lo menos un extremo o se agregara a ambos extremos de cada rollo de pelicula antes del revelado y se entregara con la pelicula aerea El velo base de la pelicula aerea no excedera de 0 10 en la unidad de densidad La densidad minima medida en el area de sombras en el negativo aereo debera ser de 0 3 ± 0 1 sobre el velo base La densidad maxima debera aproximarse pero no exceder de 1 35 La densidad se medira con un densitometro que tenga una escala de 0 a 3 0 o mas Se aplicaran las tolerancias apropiadas para los casos extremos de densidad La pelicula debera procesarse a un factor gamma de 1 2± 0 4

14 2 Los negativos llevaran visible las 4 referencias (marcas fiduciales) que determinen el punto principal de la fotografia

14 3 No sera aceptado ningun negativo que tenga el punto principal o las imagenes de este mismo punto pertenecientes a fotos adyacentes cubiertas por nubes o sus sombras, brumas densas, humos o polvo denso

14 4 Los negativos mostraran los detalles en forma definida y clara y no tendran nubes ni sombras de nubes, humo, o bruma en porcentajes mayores de 5% Los negativos en ningun caso mostraran trazas de luz, marcas de estatica, rasgaduras, ralladuras, suciedad, manchas de agua y otros defectos perjudiciales

14 5 Despues de revelar y secar el negativo, este no debera mostrar un cambio diferencial en dimensiones de mas de 0 1 milimetro Los cambios diferenciales en la dimension de la pelicula deberan determinarse comparando las dimensiones del plano focal, indicadas en el Certificado de Calibracion de la camara, con las dimensiones obtenidas al medir entre los mismos puntos registrados en la pelicula

14 6 El almacenamiento de la pelicula virgen y procesada se reglamentara por las especificaciones del fabricante

15 - Pelicula que debe utilizarse

15 1 Kodax Plus X Aerographic Estar Base 2402, o equivalente La pelicula no debera usarse despues de su fecha de vencimiento

16 - Impresiones por Contacto de Papel.

16 1 Se acompañara una copia por contacto de 23 x 23 cms sobre papel fotografico estable, blanco, mate liso, de densidad uniforme y sin defecto alguno ("Flou" y empañamiento del objetivo por descensos rapidos) Habra que utilizar una maquina de ajuste automatico de contraste para sacar las impresiones por contacto (por ejemplo, un LOG Etronic)

17 - Papel Fotografico que debe utilizarse

17 1 Kodax Polycontrast o Kodabromide de peso mediano o equivalente El papel de todas las copias sera del mismo tipo y marca

18 - Prueba de Residuos de Plata

18 1 Se efectuara una prueba de residuos de plata en todas las peliculas procesadas para asegurar un fijado completo La prueba debera realizarse en el lado emulsionado y en una zona clara de la pelicula procesada Se usara una solucion de prueba, la equivalente a la Solucion de Prueba de Residuos de PLata Kodax ST-1 Los resultados negativos de esta prueba seran la causa de su rechazo La prueba debera ser parte del rollo que se entregara

19 - Prueba de Seguridad de Archivo

19 1 El lavado minucioso de la pelicula, para asegurar la calidad del archivo, se efectuara usando una solucion de prueba del parche de hiposulfito equivalente a la Kodak Hypo Estimator y la Solucion de Prueba de Solucion Kodak HY-2 La prueba de parche se efectuara en el lado emulsionado en una zona clara de la pelicula procesada Los resultados negativos de la prueba seran una causa de su rechazo La prueba de parche sera parte del rollo que se entregara

20 - Rollos de Pelicula

20 1 Un rollo de pelicula se define como un tramo continuo de pelicula expuesta en una sola camara y/o una combinacion de lentes en un proyecto especifico Todas las exposiciones efectuadas en un proyecto se deberan retener en los rollos de pelicula

20 2 Todos los rollos de pelicula deberan tener al principio y al final una tira de pelicula en blanco, cada una de 1 0 metro de largo Si es necesario hacer un empalme para obtener el largo requerido al principio y al final del rollo, dicho empalme no será menor de 25 centímetros de la primera y/o la ultima exposicion utilizable El espesor de los tramos al principio y al final del rollo debera ser igual al de la pelicula expuesta, los empalmes al principio y al final del rollo son los unicos que se permiten en este

20 3 Se podran empalmar los rollos cortos de pelicula pero estos mantendran su identidad como rollos separados

21 - Rotulacion

21 1 Cada rollo de pelicula se numerara en orden consecutivo comenzando con el numero uno

21 2 Cada exposicion aceptada o rechazada se numerara en orden consecutivo comenzando con el numero de exposicion del rollo numero uno, y la numeracion debera continuar en orden consecutivo en todo el proyecto

21 3 Una faja se define como una sereie de fotografias aereas traslapadas tomadas a lo largo de un solo rumbo Cada faja debera numerarse en orden consecutivo comenzando con la faja numero uno y continuando en orden consecutivo todo el proyecto La fajas se separaran con una o mas exposiciones en blanco

21 4 Independientemente de la direccion de las lineas de vuelo, la numeracion de la exposicion se colocsara en la esquina superior izquierda

21 5 Las exposiciones se numeraran con cifras del tamaño no menor que el tipo de 12 puntos El numero de exposicion se colocara en la esquina apropiada (explicado en el parrafo anterior) a 3 milimetros de los bordes limitrofes dentro de la seccion expuesta del negativo

21 6 Los datos de rotulacion requeridos en la primera y ultima exposicion de cada faja continua de fotografia se anotara segun lo indicado en el Apendice I y se rotularan afuera de la seccion expuesta de la pelicula (en la parte transparente de la pelicula entre exposiciones) Las letras se colocaran adyacentes al margen aplicable de la exposicion Solo aparecera el numero de exposicion dentro de los limites de la seccion expuesta de la pelicula Cada item se espaciara de tal manera para mantenerlo separado de los demas La informacion requerida se colocara segun lo indicado en el Apendice I de esta Seccion

21 7 Todas las exposiciones, salvo la primera y la ultima en una faja, deberan llevar los datos de rotulacion dispuestos de la manera indicada en la sub-clausula anterior, pero se debera excluir la Hora Media de Greenwich (HMG), las coordenadas geograficas el numero de la faja

85

21 8 El principo y el final de cada rollo de pelicula deberan rotularse, tal como se indica en el Apendice II de esta Seccion La rotulacion se debera aplicar a la base de la pelicula

21 9 El envase para cada rollo de pelicula se rotulara adhiriendole un Registro Final de Pelicula escrito a maquina A la vez, se colocara una copia del registro dentro del envase (vease el Apendice III de esta Seccion)

21 10 Se utilizaran maquinas o aparatos de rotulacion, plantillas mecanicas de rotulacion o la rotulacion a pulso para numerar y rotular los negativos La pelicula no debera distorsionarse con la rotulacion La rotulacion debera ser legible y de caracter permanente La rotulacion no debera cubrir las marcas fiduciales

22 - Indices de Vuelo

22 1 Las fotografias a escalas 1 5000 deberan entregarse con un indice de vuelo a escala 1 50 000 en un medio estable, transparente, y reproducible Se efectuaran trazados separados para las fotografias aceptadas y rechazadas (vease los Apendices IV y V)

22 2 Las coordenadas geograficas se colocaran en las esquinas del indice de vuelo Los valores de las coordenadas se indicaran al minuto mas cercano de latitud y longitud En el trazado se colocara una flecha hacia el norte

22 3 La primera y la ultima exposicion de una linea de vuelo, o la seccion de una linea de vuelo, se trazaran y conectaran con una linea recta Dentro de cada linea de vuelo se trazaran las exposiciones que sean multiplos de 5 Se numeraran las lineas de vuelo

22 4 Los extremos de cada linea de vuelo se indicaran con un cuadrado El tamaño del cuadrado sera el area cubierta por una exposicion a la escala del indice Dentro de cada cuadrado se anotara el numero de exposicion Ademas, la primera exposicion trazada en cada linea de vuelo se identificara con los numeros de faja y rollo

22 5 Los numeros de exposicion se rotularan perpendicularmente a la linea de vuelo Los numeros de faja y rollo se rotularan paralelos a la linea de vuelo

22 6 Una tabulacion de todas las fotografías trazadas se incluiran en una seccion clara del indice

22 7 Los datos e informacion siguientes se anotaran en dos columnas en la parte superior de cada hoja de trazado

(1) Columna Uno

(a) Item 1, Nombre y Numero del Proyecto

(b) Item 2, Bloque (si es mas de un bloque)

(c) Item 3, Contratista

(d) Item 4, Tipo de fotografía Indicar la orientacion de la camara (tal como vertical u oblicua baja o alta), tipo general de pelicula usada (tal como pancromatica, infrarrojo, a colores, infrarrojo a colores) y el proposito de la fotografia, tal como para cartografia o reconocimientos

(2) Columna Dos

(a) Item 5, Altitud

(b) Item 6, Escala de Fotografia

(c) Item 7, Mapa de Referencia (si existe) y escala

E ZONA A SER CUBIERTA CON LAS FOTOS AEREAS

23 - Descripcion del area de la ciudad de Managua

23 1 La zona a ser fotografiada esta formada por un bloque de forma rectangular con las dimenciones de 25 km (Este - Oeste) y 12 5 km (Norte - Sur)

BLOQUE

VERTICE	NORTE	ESTE
1	1,346,000 00	567,500 00
2	1,346,000 00	592,500 00
3	1,333,500 00	592,500 00
4	1,333,500 00	567,500 00

Proyeccion Transversal de Mercator

Dato Horizontal Norteamericano de 1927

Esferoide de Clarke de 1866

Hojas Topograficas 1 50 000

2952 I

2952 II

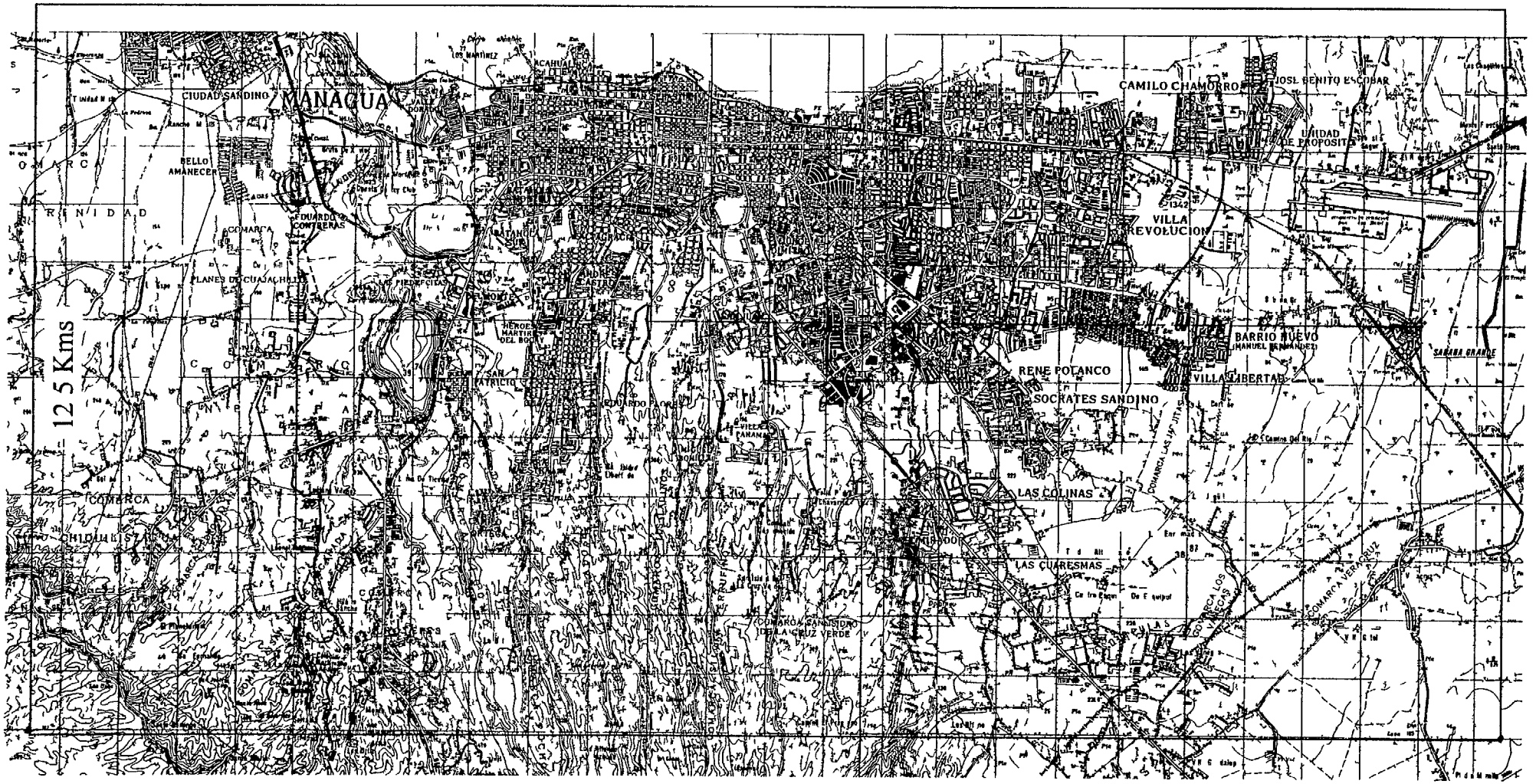
2952 III

2952 IV

47

Area 312 5 km^2
Fotos B / N
Escala de Foto 1 5000

25 Kms

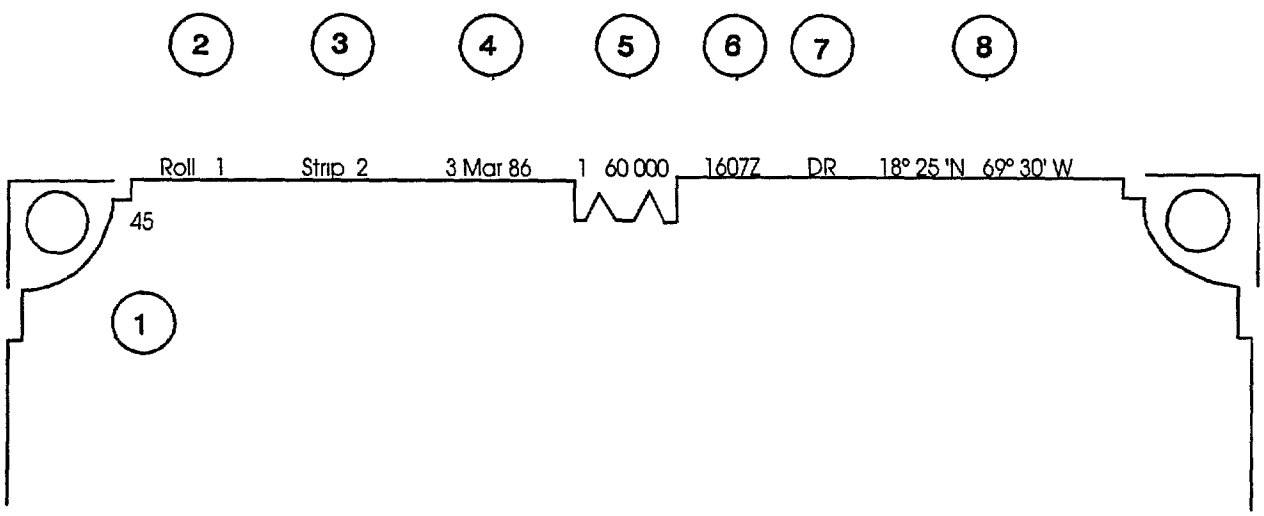


APENDICE I

EJEMPLOS DE LA DISTRIBUCION DE DATOS DE ROTULACION A SER COLOCADOS EN EXPOSICIONES AEREAS

1 Numero del Negativo
2 Numero de Rollo
3 Numero de Faja
4 Fecha de Vuelo
5 Escala
6 Hora GMT
7 Identificacion del Proyecto
8 Coordenadas Geograficas del centro de la exposicion

Los Items del 1 al 8 apareceran en la primera y ultima exposicion de cada faja continua Los Items del 1 al 4 apareceran en cada exposicion



APENDICE II

EJEMPLO DE LAS TIRAS DE ROTULACION AL PRINCIPIO Y AL FINAL DE CADA ROLLO

NOMBRE DEL PROYECTO _____

NUMERO DEL PROYECTO _____

ORGANIZACION ENCARGADA DE LA FOTOGRAFIA _____

TIPO DE FOTOGRAFIA _____

ALTITUD (PIES) _____

FECHA (S) DE VUELO _____

NUMERO DE MISION _____

NUMERO DE ROLLO _____

POSICION DE LA CAMARA _____

TIPO DE CAMARA _____ N° DE SERIE _____

TIPO DE LENTE _____ N° DE SERIE _____

DISTANCIA FOCAL _____

FILTRO _____

TIPO DE MAGAZINE _____

PELICULA _____

EXPOSICIONES ACEPTADAS ___ ___ A ___ ___, A ___ ___ A ___ ___

___ ___ A ___ ___ A ___ ___ A ___ ___

EXPOSICIONES RECHAZADAS ___ ___ A ___ ___, A ___ ___ A ___ ___

___ ___ A ___ ___ A ___ ___ A ___ ___

APENDICE III

MUESTRA DE REGISTRO FINAL DE LA PELICULA

NOMBRE DEL PROYECTO: AMERICAS	NUMERO DEL PROYECTO: 74 - 1	NUMERO DEL ROLLO: 1 y 2
ORGANIZACION DE VUELO: GLOBAL AERIAL SURVEYS	ESCALA APROXIMADA DE LA FOTOGRAFIA AEREA: 1 90 000 -	

DATOS DE LA CAMARA

	1	2	3
TIPO Y NUMERO DE SERIE DE LA CAMARA	RMK A 15/23 21220		
NUMERO DE SERIE DE LA LENTE	Pleogon 98183		
DISTANCIA FOCAL CALIBRADA	152 46 MM		
NUMERO DE SERIE DEL ALMACEN	54-398		
NUMERO DE SERIE DEL ALMACEN			

Los siguientes datos estaran basados en la primera y ultima exposicion de cada faja indicada abajo e incluida en este envase de pelicula.

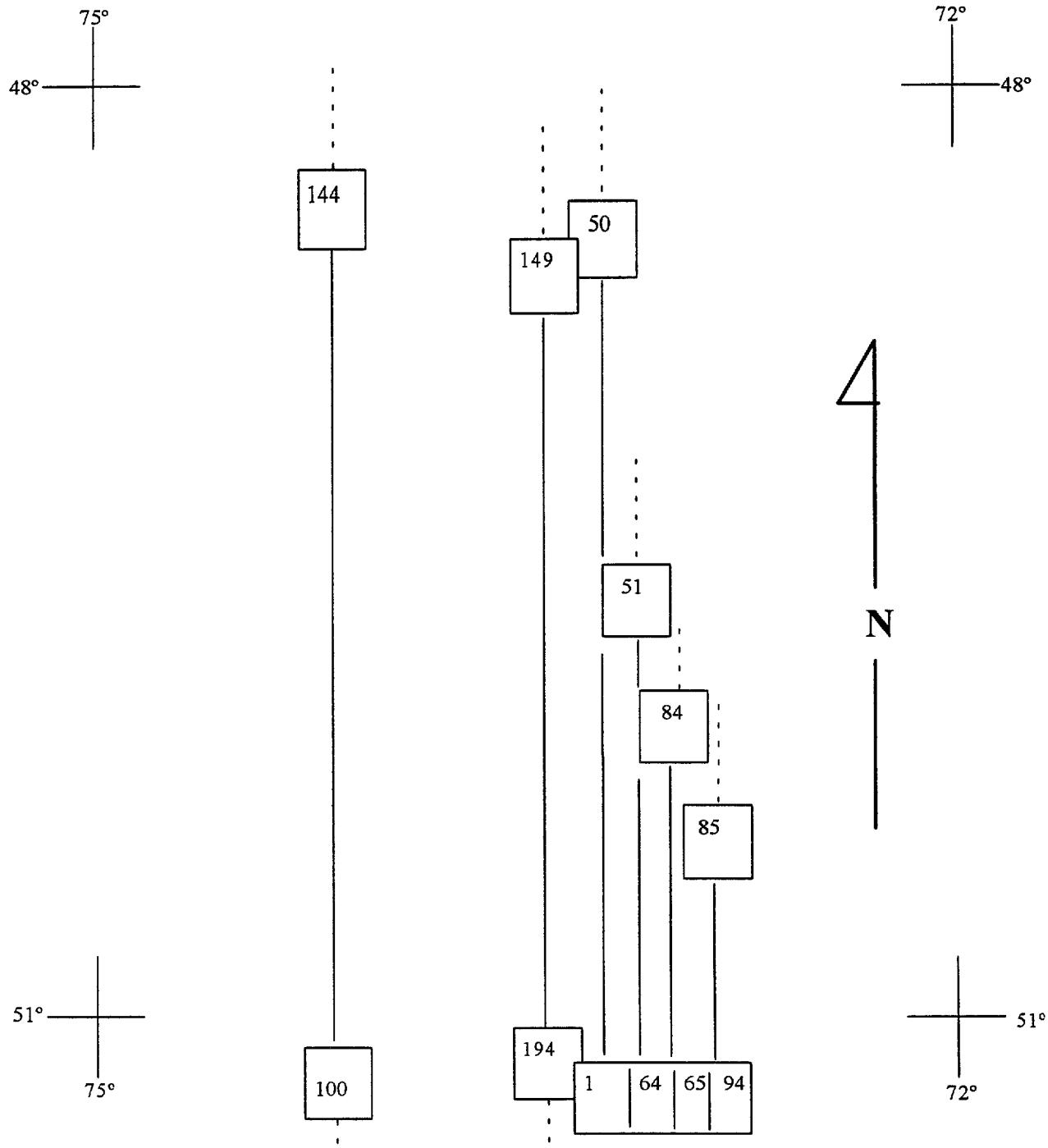
Numero de Faja	Numero de Mision	Numero de Exposicion	Fecha de Vuelo	Abertura	Velocidad del Obturador	Altitud SNM	Hora del Dia (Z)	Coordenadas Geograficas o Nombre del Lugar
Primera 66	003	1	11 Mar 75	f 8	1 / 300	45 , 000	1414	48° 15' S 73° 30' w
Ultima		50					1438	51° 19' S 73° 24 w
Primera 73	003	51	11 Mar 75	f 8	1 / 300	45 , 000	1446	50° 24' S 72° 06 w
Ultima		64					1453	51° 17' S 73° 06 w
Primera 72	003	65	11 Mar 75	f 8	1 / 300	45 , 000	1500	50° 02' S 73° 16' w
Ultima		84					1510	51° 16 S 73° 15 w
Primera 76	008	85	11 Mar 75	f 8	1 / 300	45 , 000	1516	55° 22 S 72° 55' w
Ultima		99					1524	51° 16' S 72° 54 w
Primera 65	009	100	11 Mar 75	f 8	1 / 300	45 , 000	1640	51° 17 S 73° 35 w
Ultima		148					1703	48° 12' S 73° 40' w
Primera 62	009	149	11 Mar 75	f 8	1 / 300	45 , 000	1711	48° 16' S 74° 11' w
Ultima		194					1734	51° 18 S 74° 07 w
Primera	Exposiciones Aceptadas 1 94 100 144, 149 194							
Ultima	Exposiciones Rechazadas 95 99, 145 148							
Primera								
Ultima								

91

APENDICE IV

MUESTRA DE PLOTEO DE LINEAS DE VUELO

NOMBRE Y NUMERO DEL PROYECTO	AMERICAS 70 - 1	ALTITUD	45, 000 SNM
AREA	2	ESCALA DE LA FOTOGRAFIA	1 90 , 000
CONTRATISTA	GLOBAL AERIAL SURVEYS	REFERENCIA Y ESCALA DEL MAPA	ONC T -18
TIPO DE FOTOGRAFIA	VERTICAL, PANCROMATICA, CARTOGRAFICA		ONC S - 21
			1 1, 000 000



AREA 2 FOTOGRAFIAS ACEPTADAS

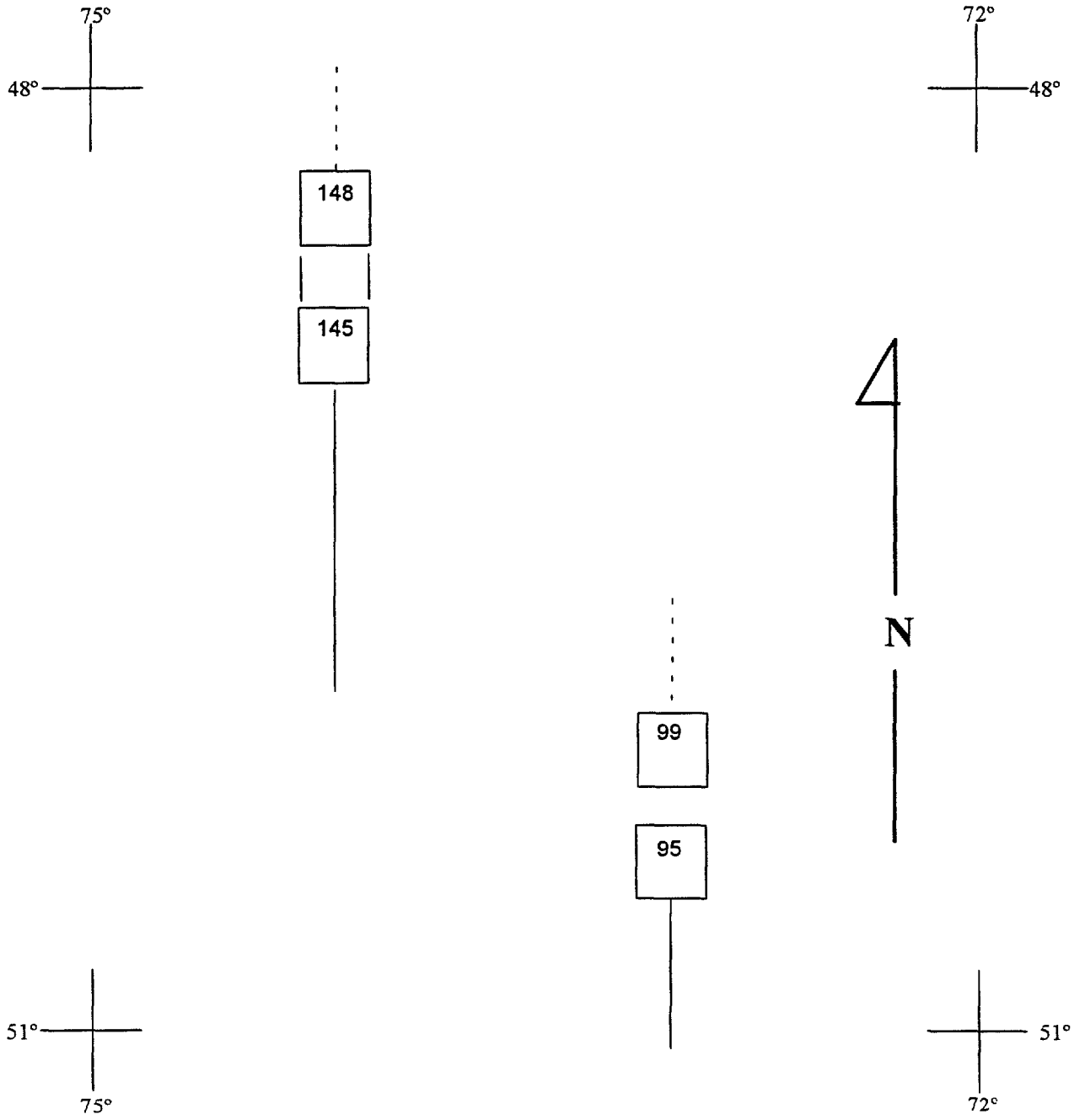
TIPO DE CAMARA ZEISS RMK A 15/23				DISTANCIA FOCAL 152,46 MM		
ROLLO	FAJA	EXPOSICIONES NUNERO	FECHA DE VUELO	CAMARA NUMERO	LENTE NUMERO	ALMACEN NUMERO
1	66 73 72	1 - 50 51 - 64 65 - 84	11 Mar 75	21220	98183	54-398
2	74 65 62	85 - 94 100 144 149 - 194	11 Mar 75	21220	98183	54-398

APENDICE V

MUESTRA DE PLOTEO DE LINEAS DE VUELO

NOMBRE Y NUMERO DEL PROYECTO - AMERICAS 74 - 1
AREA 2
CONTRATISTA GLOBAL AERIAL SURVEYS
TIPO DE FOTOGRAFIA VERTICAL, PANCROMATICA, CARTOGRAFICA

ALTITUD 45, 000 SNM
ESCALA DE LA FOTOGRAFIA 1 90 , 000
REFERENCIA Y ESCALA DEL MAPA ONC T 18
ONC S - 21
1 1, 000 000



AREA 2 FOTOGRAFIAS RECHAZADAS

TIPO DE CAMARA ZEISS RMK A 15/23				DISTANCIA FOCAL 152,46 MM		
ROLLO	FAJA	EXPOSICIONES NUNERO	FECHA DE VUELO	CAMARA NUMERO	LENTE NUMERO	ALMACEN NUMERO
1	74	95 99	11 Mar 75	21220	98183	54-29
2	65	145 148				

95

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07 SET. 1994
7718

Registro de la Propiedad
Sistema de Índice de la Propiedad
(SIP)

Contenidos

Antecedentes	2
Objetivos del sistema	2
Productos finales de la presente propuesta	2
Metodología de trabajo	3
Características del sistema	3
Cronograma	4
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Antecedentes

El Registro Publico de la Propiedad actualmente lleva un sistema de indices de escrituras manual que incluye los siguientes pasos

1 Revision preliminar de las escrituras
2 Cobro y elaboracion del recibo de caja
3 Colocacion de las escrituras en una cola de espera para ser procesadas en el orden en que se reciben
4 Anotacion manual de un resumen de las escrituras en el Libro de indice diario
5 Anotacion manual de la fecha, numero de tomo folio y asiento en la escritura original

Los dos ultimos pasos generan el principal cuello de botella del sistema, puesto que el numero de tomo folio y asiento dependen de la posicion fisica del resumen en el Libro de indice diario, y solo puede haber un Libro de indice diario en uso, por ende solo puede haber una persona haciendo estas anotaciones

Ademas el lexico y formato de las anotaciones resumen dependen, en gran parte, de la persona que las realiza por lo tanto, carecen del nivel de estandarizacion deseado

Objetivos del sistema

Los objetivos principales del *Sistema de Indice de la Propiedad (SIP)* son

- Permitir la indexacion paralela de dos o mas escrituras simultaneamente
- Reducir el tiempo de indexacion de escrituras automatizando el proceso de captacion manual
- Generar el numero de indice automaticamente
- Imprimir el Libro diario de indices
- Estandarizar nomenclatura y formato de los resumenes del Libro diario de indices
- Generar una base de datos con el Libro de indices para uso posterior
- Proveer los mecanismos de respaldo magnetico del Libro diario de indices
- Eliminar la posibilidad de espacios no utilizados en el Libro de indices

Productos finales de la presente propuesta

- Documento de analisis de la situacion actual que incluye
  - ✓ Requisitos a corto plazo del Registro
  - ✓ Recomendaciones de equipo
  - ✓ Sugerencias de mejoras a procedimientos actuales
- Diseño de base de datos relacional normalizada
- Diseño de pantallas de captura menues actualizacion de tablas y parametros del sistema
- Diseño de formatos de impresion
- Entrega de programas fuentes escritos en Clipper, version 5 2
- Implementacion del *SIP* en las computadoras del Registro
- Instalacion la red de telecomunicaciones
- Configuracion de terminales
- Configuracion del servidor de archivos
- Entrenamiento de usuarios

Metodologia de trabajo

Para garantizar que el *SIP* cumpla con los requisitos del Registro tanto de fondo como de forma, la consultoria estaria dividida en siete etapas concretas

1 Elaboracion y aprobacion del documento de analisis
2 Elaboracion del diseño del sistema
3 Creacion del sistema, incluyendo base de datos, tablas documentos machotes y programas fuentes
4 Implementacion del sistema
5 Entrenamiento de los usuarios
6 Revision del sistema, mediante un periodo de prueba de corrida en paralelo
7 Correcciones y ajustes al sistema fruto de la revision

Cada una de estas etapas tomara la retro-alimentacion del usuario de la etapa anterior como insumo principal

Se procedera a pasar a la siguiente etapa solamente despues de que el usuario, en forma de un comité de direccion apruebe los resultados de la etapa concluida, mediante el documento de resultados de etapa

Caracteristicas del sistema

La programacion del *SIP* tendria las siguientes caracteristicas

- 100% parametrico
- Acceso limitado utilizando claves de acceso secretas
- Listo para funcionar en redes
- Bitacora de acceso al sistema
- Insercion automatica de la fecha, hora y nombre del usuario por cada escritura indexada
- Modelo de impresora configurable desde el paquete (diferentes manejadores de impresora), incluyendo laser e impresora de puntos
- Ayuda sensitiva al contexto
- Deteccion automatica del tipo de color (color, b&n, ambar)
- Configuracion de los colores de pantalla
- Mantenimiento restringido de todas las tablas del sistema

9'

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Cronograma

El siguiente cronograma lista la secuencia del desarrollo de las diferentes etapas del proyecto

Actividad	Estimado Fecha Inicio	Estimado Fecha Fin	Dias	Desde 19/09 Hasta 20/09	21/09 22/09	23/09 24/09	25/09 26/09	27/09 28/09	29/09 30/09	01/10 02/10	03/10 04/10	05/10 06/10	07/10 08/10	09/10 10/10	11/10 12/10	13/10 14/10	15/10 16/10	17/10 18/10	19/10 20/10	21/10 22/10	23/10 24/10	25/10 26/10	27/10 28/10	29/10 30/10	31/10 01/11	02/11 03/11	04/11 05/11	06/11 07/11	08/11 09/11	10/11 11/11	12/11 13/11	14/11 15/11	16/11 17/11	18/11 19/11	20/11 21/11	22/11 23/11	24/11 25/11
Elaboración/aprobación documento de análisis	19-sep	23-sep	5	1	1	1																															
Elaboración del diseño del sistema	24-sep	30-sep	7			1	1	1	1																												
Creación del sistema	1-oct	15-oct	15							1	1	1	1	1	1	1	1																				
Implementación del sistema	12-oct	21-oct	10												1	1	1	1	1	1																	
Entrenamiento de los usuarios	24-oct	28-oct	5																		1	1	1														
Corrida en paralelo	31-oct	4-nov	5																						1	1	1										
Correcciones y ajustes al sistema	5-nov	11-nov	7																								1	1	1	1							
Periodo de soporte a usuarios	14-nov	25-nov	12																													1	1	1	1	1	1

A la izquierda aparece el nombre de cada etapa, seguido por sus fechas de inicio y fin y los dias de duracion La parte derecha del cuadro muestra el GANT tentativo, basado en las fechas sugeridas para cada actividad Cada columna del GANT representa 2 dias naturales

Este cronograma asume que el proyecto inicia el dia 19 de Setiembre Cualquier cambio a la fecha de inicio tendria una repercusión en este cuadro de fechas, y por lo tanto, en la fecha de conclusion

Costos

El costo total del proyecto es de US$9 419, pagaderos en cordobas al tipo de cambio oficial del dia en que se realicen los tres pagos, siguiendo la siguiente tabla de pagos

Primer pago de US$3,000, pagadero contra la firma del contrato
Segundo pago, de US$3,000, pagadero al concluir la implementacion del sistema
Tercer y ultimo pago, de US$3,419, pagadero al concluir el periodo de soporte a usuarios

E Hendrix

Conference on Property Co-Sponsored by Carter Center ~~and UNDP~~
July 5, 1995

Points of Consensus

1. Security for Small Property Holders

There is a general consensus that distribution of small plots of land and houses to people of few resources serves a social benefit for the country. The current administrative procedure reviews such cases and grants a solvencia to document that they have complied with the laws of the country.

Solvencias, however, do not grant property rights. The process of surveying and processing the title will take some time, perhaps two to three years for all of the cases in the country. In addition, in many cases, the government does not currently have possession of the titles and can only receive those titles when the former owners receive compensation for land expropriated for social uses.

Therefore, the participants agree that some protection for the small property holders is desirable until they receive the full title. At least two options were discussed: First, a law could give protection to legitimate holders of solvencias against suits or evictions. Any occupants who do not hold legitimate solvencias would be dealt with through the courts. This option received wide, though not universal support, and therefore is the more feasible of these options. However, the manner of implementation of this idea should be left to the Assembly and the Executive.

An alternative is that the state could exercise its rights of eminent domain and expropriate property for social uses, provided owners are promptly and adequately compensated. The problem here is that this option would mean post hoc compensation over a long term, rather than immediate, cash compensation as usually contemplated in such expropriations.

2. Compensation for Confiscados

There is a broad consensus that confiscados of small and larger properties should receive prompt and fair compensation, and that the indemnification bonds issued by the government need to be increased in value.

The primary mechanism to raise the value of the bonds is to use a substantial portion, if not all, of the revenues from the privatization of at least 40% of Telcor to provide guarantees for the bonds. The sale of Telcor and the use of the proceeds would be overseen by a mixed commission including the executive and legislative branches, confiscados, and others.

3. Large Properties

A broad consensus was evident that occupants of properties larger than some social benefit value should pay to receive title. This payment, which could be at cadastral value, would in effect pay for the indemnization to the prior owner, rather than having taxpayers pay for these large properties.

4. Abuses/Enforcement

All participants agreed that the existing laws should be enforced, and abusers should be prosecuted by the Attorney General's office and the courts.

5. Institutional Mechanisms for Mediation or Arbitration

When appropriate, domestic or international arbitrators should be used on cases not resolvable by the government's review process and prior to the appeal in the courts.

6. Follow-Up Mechanisms

President Carter suggests that to follow-up this meeting and ensure the expeditious implementation of these steps, a committee should be established representing the Executive (3 Ministers), the Assembly (3 Diputados), 1 Confiscado, 1 Bondholder, 1 person from Communal Movement, 1 from UNAG, and 1 from UPANIC. The UNDP should convene the first meeting within ten days.