PROPERTY REGISTRIES

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In many LAC countries, property registries are in need of reform. The few real estate transactions that are recorded rarely include a physical description and map of the property. As a result, governments do not have the ability to guarantee property boundaries effectively.

This can lead to a number of problems, especially insecurity about property ownership. Other problems include managing sewage treatment, irrigation, road construction, mail service, telephone lines, electrical lines, zoning, environmental protection, land use restrictions, and soil quality control. To effectively oversee land use, governments need to evaluate a wide range of easily accessible data. A multipurpose land information system (MPLIS) can be an important tool to help governments manage land use and make complex decisions.

This bulletin, written by Steven Hendrix and David Moyer, examines MPLIS benefits, design, implementation, and cost.

This is the second in a series of technical papers published by the AID Agriculture and Rural Development Technical Services project (LAC TECH) to disseminate technical findings and products of the project. See back page for subscription and other information.

THE MULTIPURPOSE LAND INFORMATION SYSTEM

An MPLIS is a central database that typically contains information about land, such as ownership, use, cover, soils, geology, zoning, wetlands, and floodplains. MPLIS uses a common reference framework (usually the geodetic survey network) that links or integrates all the data in the system.

The land survey links the data, making it possible to combine and coordinate different-layer data for a wide variety of uses. Normally, the MPLIS uses geographic information systems (GIS), or computer programs designed to track geographic information, although it is possible to design a MPLIS that does not use computer programs.

Each layer is maintained by its own custodian. For example, the Department of Natural Resources might maintain information on wetlands, while the Department of Agriculture might maintain soil information.

Seven Steps to Design an MPLIS

- Assess user needs.
- Perform systems requirements analysis.
- Design system.
- Design implementation plan.
- Determine the scope of the system.
- Introduce MPLIS technology to the community that will develop and use the system.
- Design pilot projects, demonstrations, and bench mark evaluations.

BENEFITS

Perhaps the greatest benefit from an MPLIS is that it automates many manual processes. It lowers some costs by reducing data duplication and stabilizes others, benefiting government operations in general.

Improved responsiveness is another benefit of an MPLIS. Titles can be issued more quickly due to the availability of a complete, coordinated database. New data from emerging technologies, such as location data from global positioning systems, can be added to the database quickly

and easily. Improved access to data and the ability to use it for additional tasks improves the government's effectiveness.

In addition, improvements in the land-transfer process—providing an equitable basis for property taxation and providing information for resource management and environmental planning—can be expected with an MPLIS.

Finally, MPLIS systems are perceived to be more fair and equitable than manual systems. Land information technology can incorporate detailed information without the real or perceived biases sometimes associated with manual systems.

Use of the system will increase since users believe they are being treated more fairly. Ad hoc, subjective evaluations are avoided, making the process more uniform and equitable.

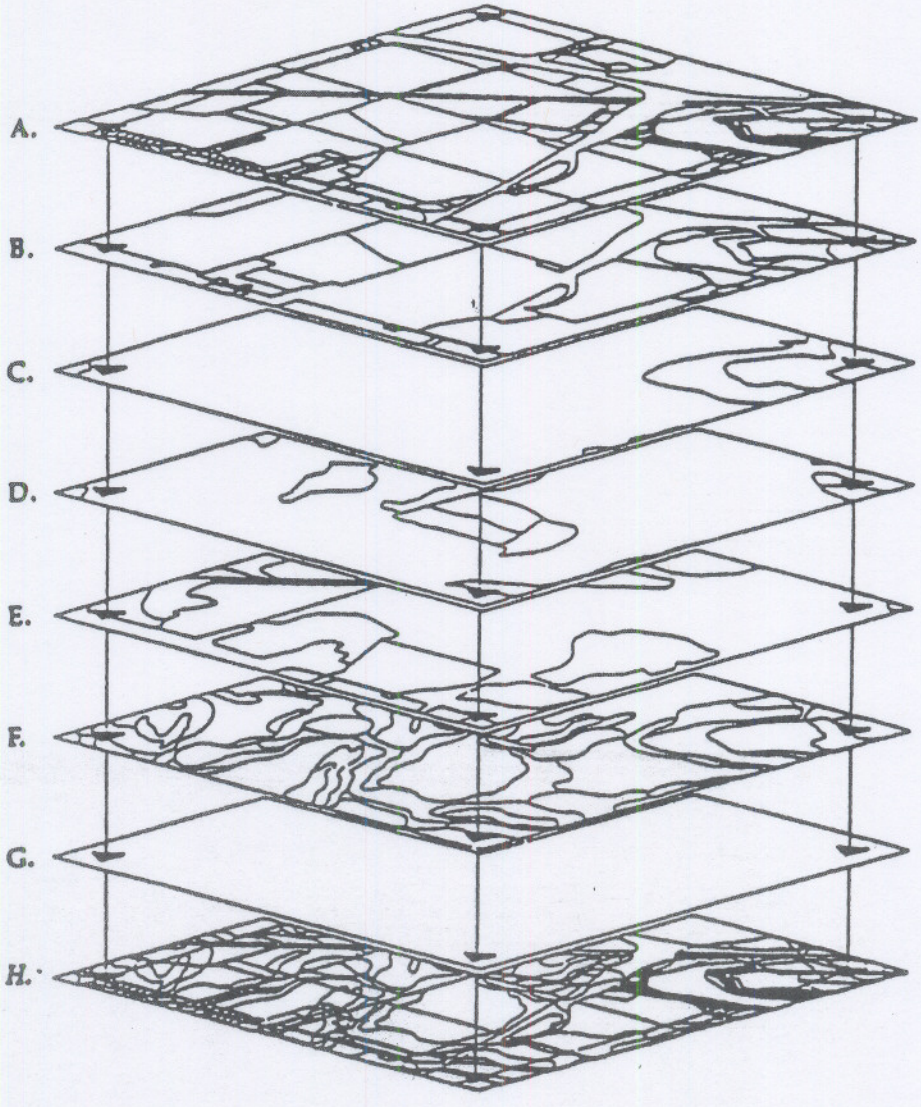
DESIGN

The first step in designing an MPLIS is to perform a cost-benefit analysis to assess whether the system is truly needed, and if so, where. The analysis should identify priority areas and examine alternative land regularization approaches. Different strategies may be used, depending on the areas of the country.

Designers must be careful to avoid "parachuting" modern computerized technology into developing countries and "leapfrogging" their development and management without consideration for the people, culture, and institutional fabric. It is much better to design a system with local needs and capacities in mind, and look for technology that fits those needs, than to force

Figure 1. Graphic representation of an MPLIS

(Sample from the town of Westport, Dane County, Wisconsin.)



Data Layer	Responsible Agency
A. Parcels	Surveyor, Dane County
B. Zoning	Zoning Administrator, Dane County
C. Floodplains	Zoning Administrator, Dane County
D. Wetlands	Wisconsin Department of Natural Resources
E. Land Cover	Dane County Land Conservation Committee
F. Soils	U.S. Department of Agriculture, Soil Conservation Services
G. Reference Framework	Public Land Survey System (geodetic coordinates)
H. Composite Overlay	Integrated layers as needed (H is a compilation of A, F, and G)

Source: Land Information and Computer Graphics Facility, School of Natural Resources, University of Wisconsin-Madison.

a predetermined system onto circumstances it might not fit.

A set of short- and long-term goals for the system should be developed at the outset. The needs of all users and how they can be met through an integrated information system should be assessed to determine specific attributes. An assessment of users should ask:

- Who uses the land records?
- What private sector user needs exist?
- What kinds of data do the organizations manage?
- How are the data used?
- How often are records accessed and updated?
- Who is responsible for data maintenance?
- What improvements are possible through automation?

Finally, while specificity is a desirable virtue of an MPLIS plan, flexibility as the project develops is also important. Both the needs and the technology will change and expand. Therefore, the system design should be specific enough that goals and objectives are easily identified, but flexible enough that they may be reached through the most effective means possible.

An MPLIS is more than data, computer programs, and computers. It also includes staff and institutional support for its operation. A coordinated program to build and maintain all aspects of an MPLIS is needed for its success. The complexity of such systems requires that a variety of skilled people from the government and private sector be included in the design effort. These include computer programmers and experts in law, cadastre, and land tenure.

> Designers must avoid "parachuting" modern computer technology into developing countries without consideration for the people, culture, and institutional fabric.

IMPLEMENTATION

Once an MPLIS is designed, a plan is needed for implementation. A major consideration in MPLIS implementation is how the shift from the current manual system to the new automated system will occur. Normally, pilot projects, demonstrations, and benchmark evaluations are carried out on a small scale before full commitment is made to the new system. For example, a new property registry system may be tested in one or two states before being implemented nationally. Pilot projects provide the opportunity to fine-tune the system, work with the hardware and software, and apply different solutions.

Using the measurable objectives and priorities developed by the system's builders and users, monitoring should be carried out to provide guidance to both system operators and policy makers, who are needed to ensure financial support. Monitoring should include periodic reports on the overall MPLIS, as well as reports on specific functions

Cost of Mapping and Titling Projects for Honduras, Ecuador, and St. Lucia

	Delineation and mapping, U.S. dollars per hectare	Titling, U.S. dollars per hectare
Honduras	4.50	19.00
Ecuador	4.60	(not available)
St. Lucia	49.00	59.00

Source: *A Comparative Evaluation Framework for Cadastre-based Land Information Systems (CLIS) in Developing Countries* (Land Tenure Center, 1990).

such as property registration. Users and systems operators should be involved and clearly informed of the purpose and nature of these evaluations.

COST

One factor that makes policy makers reluctant to implement an MPLIS system is the high start-up cost. The costs of MPLIS tend to occur early in the life cycle. Hardware, software, and data, which often amount to 75 percent or more of total costs, must be purchased before the system goes into operation. Benefits, on the other hand, tend to be generated over a longer period of time.

This means that total benefits do not equal total costs until after 5 or 10 years. Benefits may be hard to quantify because they include intangible results such as more effective land management or improved staff morale. These factors make it difficult to develop a precise economic evaluation of an MPLIS before it is put into operation.

To save money, the implementation plan should be incremental. Phase-in should be analyzed in terms of the immediate needs of government and the private sector for output from the system. That is, a particular need to improve the property registry system, revise the property tax system, or solve a specific environmental or land use problem may make it necessary to assign priorities based on criteria other than cost.

One way to develop a priority list for funding an MPLIS is to consider the components of the system itself. For example, one of the first components to be funded is usually the geodetic foundation, since this is the basis for spatial coordinates by which all layers of data can be linked and analyzed. Base layers are often developed as a background for other spatial data layers. Computer hardware and software are needed immediately to produce, manage, and integrate these layers. Finally, people and procedures are needed to operate and maintain the system.

As additional funds and needs surface, more data layers can be added. It is critical that a comprehensive plan be completed before any part of the system is implemented to ensure that pieces added later will drop neatly into place and provide the output desired.

ADDITIONAL READING

The following publications can be obtained from the Land Tenure Center, University of Wisconsin-Madison, Madison, WI 53706, Attn: Publication Request (phone 608-262-3657). These publications are free of charge to AID offices. For further information contact Steve Hendrix at LAC TECH.

Grenville Barnes, *A Comparative Evaluation Framework for Cadastre-Based Land Information Systems (CLIS) in Developing Countries* (Land Tenure Center, 1990).

D. David Moyer, *Geographic Information Systems: Definitions, Concepts and Applications* (Institute for Environmental Studies, University of Wisconsin-Madison, 1989).

J. David Stanfield, *Projects that Title Land in Central and South America and the Caribbean: Expectations and Problems* (Land Tenure Center, 1985).

Steven E. Hendrix, D. David Moyer, and Ronald S. Strochlic, *Land Registry Reform in Guatemala: A Status Report with Recommendations* (LAC TECH/Land Tenure Center, 1992).

LAC TECH is a regional technical support project managed by the Rural Development division, AID Bureau for Latin America and the Caribbean (LAC/DR/RD). The project provides support services to AID missions and the LAC Bureau in agriculture and natural resources management.

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