

Low Cost Technologies and Techniques in Implementing Cadastral and SIM Infrastructures

Dr Chryssy A Potsiou
Prof Babis Ioannidis

chryssyp@survey.ntua.gr
cioannid@survey.ntua.gr

National Technical University of Athens
Greece

The Importance of Land Administration Systems to Support the Economy

Land is a source of wealth

Trust among citizens-business-government is the
foundation of economic well-being.

Confidence–Investments–Improvement–Economic
Growth

Systems that secure land tenure and serve land
transfer are the tools to make the realization of this
wealth possible

Trade in Land requires clear determination of the
basics of the transaction:

- ownership rights
- mortgage rights
- restrictions on use/ownership
- easy resolving procedures of possible disputes
- ...

Where lengthy and costly procedures are needed
-customary tenure- they restrict land market to local
circles of trading partners

Good Land Administration systems:

- guarantee ownership, secure land tenure / reduce
disputes on land
- bring *security for credit* / support the *mortgage market*
- support the *Land market / Rental market*
- encourage *investments / infrastructure in urban land*
- support the transparent urban / rural land use control
- support the agricultural projects in rural areas
- serve the environment resources management
- protect state lands
- serve land and property tax collection
- produce statistical data

The amount of transactions
selling-buying,
leasing,
renting,
establishing user rights,
mortgaging

has a profound impact on the **national economy**
& on the economy of the **individual citizen**

Land Policies : policies about ownership,
value & use of the land

Low Cost in Land Administration

Building or re-building a national cadastre is
considered to be a time & cost demanding process
(government funds, grants and loans)

Economic pressure, demands for cost-effective ways
and tools:

Good Results within **less time** and **low budget**

Does cost control mean:

Cheap equipment and **lower quality** ?

- Expensive equipment may save overall costs
- Rapid technological developments
“technology refresh”
- Definition of quality according to present and future needs of the project:
 - strategic plan,
 - future integration,
 - upgrading

Time required is the most costly factor

Less time = Low cost & More productivity

- ✓ minimize labor
- ✓ Quality Control / Quality Assurance mechanisms
 - efficiency
 - accountability
 - good quality of service-data and services that are fit for purpose and use
 - satisfying customers' needs
- ➔ Low cost in Implementation
- ➔ Low operational cost / sustainability

Low cost in Implementation

Factors that influence the cost of establishing a LAS :

- **Design/plan-strategic plan**

take into consideration:

- ✓ existing system,
- ✓ statutory law referring to land issues,
- ✓ customary tenure,
- ✓ ongoing relevant LA projects
- identify clear and tangible economical benefits
- identify customers' needs and set the priorities
- justification of costs, necessary budgets

- **Technical approach**

take into consideration:

- ✓ size of the country,
- ✓ accuracy of data,
- ✓ involvement of private sector,
- ✓ use of common & well established methods to secure good results,
- ✓ focus on improving the land market
- Flexibility should be given to the selection of equipment and method
- “Quality”, high accuracy should be sacrificed to reduce the costs and duration and ensure financing for full national coverage
- Existing stock of spatial data should be used

- General boundaries are recommendable
- Appropriate scales for LAS between 1:10000 & 1:1000
- Data collection methods:
 - ❖ Field surveying
 - ❖ GPS measurements for the definition of control points or boundary points
 - ❖ Photogrammetry:
 - enlarged airphotos,
 - orthophotos / rectified photos,
 - high resolution satellite images ICONOS/Quick Bird, (orthophotos without GCP at scales 1:10000, or with GCP at scales 1:5000 & 1:2500)
 - Satellite images with pixel size <0.5m will be available soon,
 - DTM derived from airphotos or satellite images,
 - stereorestitutions
 - ❖ Existing maps
 - ❖ Combination of the above methods

- **Data processing and dissemination**

best results are achieved when

- ❖ Land Registration/cadastre know-how and specialist computer expertise are brought together
- ❖ IT in-house developments are costly and ineffective for large projects
- **Development of e-land market**
- to increase the efficiency and the public acceptance and reduce the operational costs:
 - ❖ Internet,
 - ❖ Electronic signatures,
 - ❖ SDIs,
 - ❖ New tools for data sharing like OpenGIS

• **Legal & Institutional approach**

take into consideration:

- ✓ collect only those data that you can maintain/update,
- ✓ LA is a broad issue: mapping, registration of rights, valuation, taxation, physical planning,
- ✓ many agencies are involved

- to limit the registration of objects to what is legally acceptable
- to handle disputes administratively outside regular courts
67% of the cost in Greece
- break down large nation wide projects into smaller parts
care for harmonization of data
- make all institutional and responsibility arrangements among involved agencies clear
- avoid big institutional and organizational changes to reduce conflicts
- avoid delays and extra costs for legislative and organizational arrangements
Being joined-up does not mean being under the same agency → It rather means sharing data and having common goals
- encourage Public-Public coordination between relative on-going projects
to avoid duplication of effort, costs & data collection

**Low operational cost
Sustainability of the cadastral systems**

Commercialization-introduce business culture into public sector. Reasons:

- increased need for funds/ need for continuous technological updating
- restricted governmental funds
- emerging local and international demands to serve customers

LA is a public good/state responsibility-“fees” should be affordable, some basic info for free (taxes)

Weak & poor should have access

public servant & business approach –conflicting principles

Fee policies vary in different countries

Cost recoverability

- **The users pay for the cost of making data available, but not for their collection & updating**
- **Partial cost recovery**
some of the income comes from central or local government - service agreements, data, services at certain price
cartographic agencies-cadastrals
- **Full cost recovery**
transactions of land & legal rights bring revenue from the individuals
- **Profit making**
sometimes the profit is reinvested into the same agency-new equipment, specific research

Cooperation & Information sharing

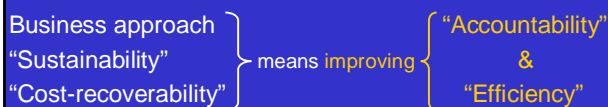
Conclusions

Reducing costs is a complicated issue

Depends on:

- ✓ **Tools and methods** *but also on:*
- ✓ **Decision making** *and on:*

- Identification of the needs
- Supervision & progress assessment
- Political influence
- Culture
- Education
- Capacity building
- Experience



Proposals

More research in:

- Methods for surveying users' needs
- Methods in estimating users' satisfaction
- Methods in improving efficiency and proficiency
- Resolving legal issues more through by-laws, national standards & regulations
- Raising awareness at high political level
- Raising capacity building & education in LA
- Measuring the impact of the project-economic benefits-estimating costs
- Creating new forms of land tenure, integration of customary tenure