

Developing Resilient and Responsive Land Administration Systems in Latin America

Desarrollando Sistemas de Administración de Tierras Resilientes y Relevantes en América Latina

FIG Conference
San Jose
Costa Rica

STRUCTURE

- Pioneer Projects (1960s)
- Land Administration Projects (1996-2007)
- Cadastral Surveying Challenge
- GPS
- Cost of Land Administration
- Resilience Framework

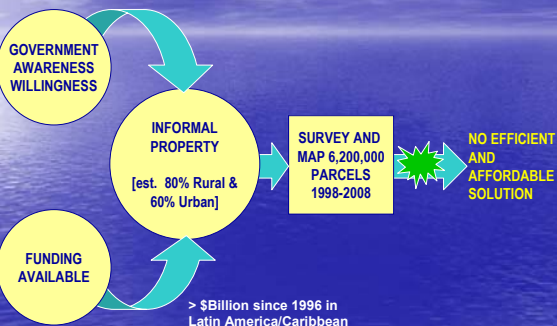
PIONEER PROJECTS



Land Administration Projects and Funding Agency



Cadastral Surveying Challenge in LatAm/Caribbean



DEVELOPING A RAPID GPS METHODOLOGY (1994 – 2000)



Barriers to GPS Technology Adoption



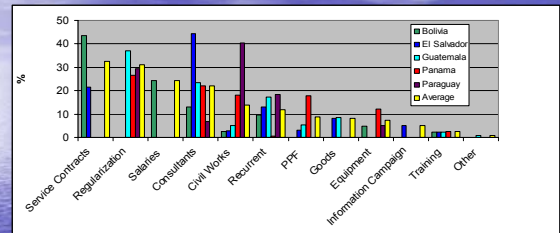
(adapted from Niemann, Ventura et al 1988)

Comparison of per parcel costs based on Total Project Costs

Project	US\$M	# Parcels	Dates	\$/parcel	Area (MHa)	Sha
Peru (PETT1)	36.5	1,000,000	1997-2002	37	na	na
El Salvador	70	1,700,000	1996-2005	41	1.9	37
Peru (PETT2)	46.7	170,000	2003-2007	62	3.6	13
Costa Rica (IDB)	92	520,000	2002-2007	177	na	na
Bolivia (PNAT)	28	10,000	1995-2003	2800	3.7	8
Bolivia (St. Cruz)	15	140,000	2006-2010	107	na	na
Ecuador (PRAT)	16	135,000	2003-2007	119	0.6	27
Nicaragua (PRODEP)	2.4	90,000	2003-2010	27	1.4	2
Belize (LMP)	8.9	40,000	2003-2006	223	na	na
Panama (IARP-IDB)	72.3	120,000	2003-2008	603	0.75	96
Panama (ProNAT)	47.9	80,000	2001-2007	599	1.1	44
Average	40	420,000		436	1.9	21
Average (without PNAT)	41			200		

Breakdown of Budgeted Costs for Five Countries - Procurement

Procurement Type	Bolivia		El Salvador		Guatemala		Panama		Paraguay	
	Amount	% of total	Amount	% of total	Amount	% of total	Amount	% of total	Amount	% of total
Civil Works	0.7	2.5	2	2.9	2	5.2	13.13	18.1	16.6	40.4
Goods			5.7	8.1	3.3	8.5				
Equipment	1.3	4.8					8.87	12.3	2.1	5.1
Training	0.7	2.4	1.6	2.3	0.9	2.3	1.93	2.7		
Service Contracts	11.8	43.5	15	21.4						
Consultants	3.5	12.9	31.1	44.4	9.1	23.5	15.88	21.9	2.8	6.8
Salaries	6.6	24.2								
Regularization					14.4	37.1	19.13	26.4	12.1	29.4
Information Campaign			3.5	5.0						
PPF			2.1	3.0	2.1	5.4	12.95	17.9		
Recurrent	2.6	9.7	9	12.9	6.7	17.3	0.47	0.6	7.5	18.2
Other					0.3	0.8				
Total	27.2	100	70	100	38.8	100	72.36	100	41.1	100.0
Source		(p. 86)		(p. 22)		(Ann.6)		(p.70)		(p. 25)



Breakdown of Budgeted Costs for Five Countries - Procurement

Previous Studies on Costs/Benefits

Source	Mapping	Adjudication	Surveying	Registration	Institutional Strengthening
Berstein (1985)	38%	29%		6%	13%
Dale/McLaughlin (1990)	20-25%		30-50%	20-25%	10-15%
Habstein (1993)	24	18	22	23	13

Based on the NE Brazil Project Costs. Other components included Support for Land Restructuring (9%), Project Administration (4%) and Studies (1%)

Land Tenure Identification

Cadastre Implementation and Tiling

Quantifying Costs - Land Admin Processes

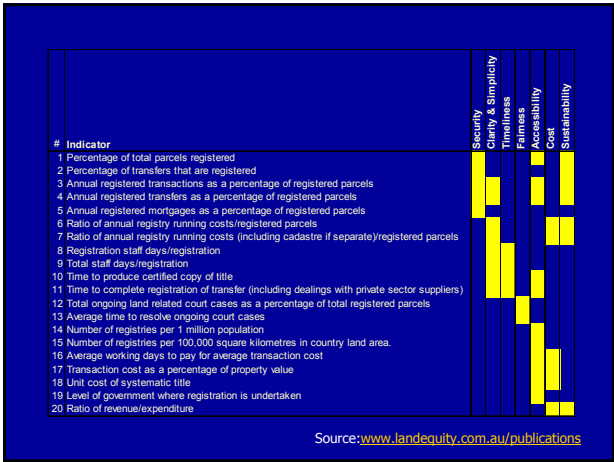
- \$450 vs \$47 vs \$1
- Impacts of Scale and Technology
- Country Studies – Lat Am & Car (4), E. Europe (4), Asia (4), Africa (5)
- Regional Summary
- Global Summary/Analysis

Africa	Asia	E. Europe and Central Asia (EAC)	Latin America and the Caribbean (LAC)
<ul style="list-style-type: none"> Ghana Mozambique Namibia South Africa Uganda 	<ul style="list-style-type: none"> Indonesia Karnataka (India) Philippines Thailand 	<ul style="list-style-type: none"> Armenia Kyrgyzstan Latvia Moldova 	<ul style="list-style-type: none"> Bolivia El Salvador Perú Trinidad & Tobago

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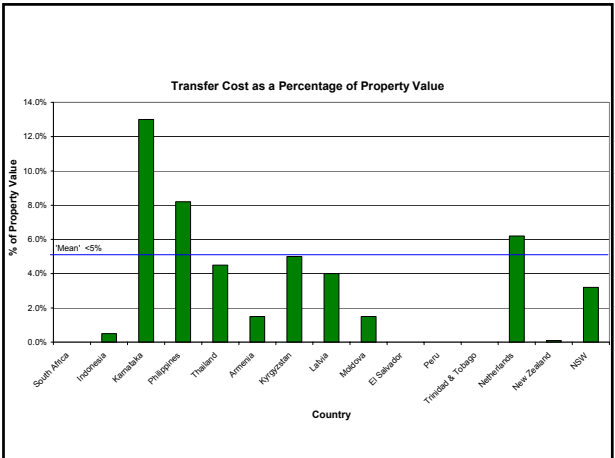
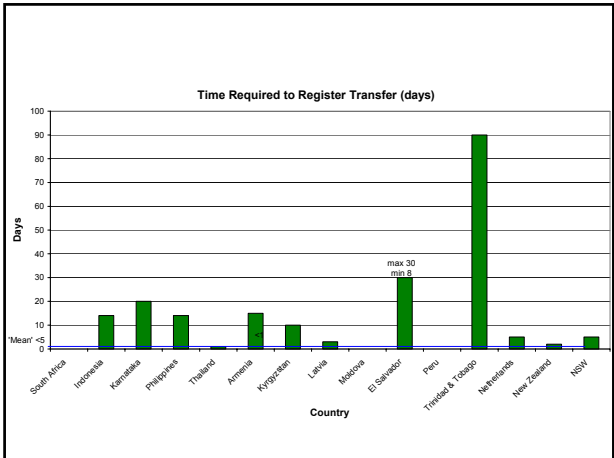
Global Report (Tony Burns and Land Equity)

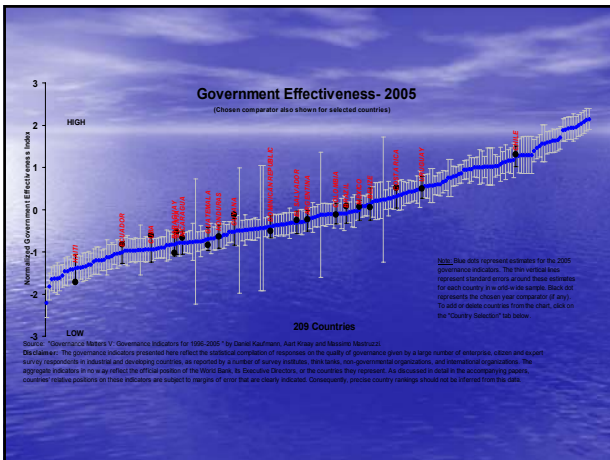
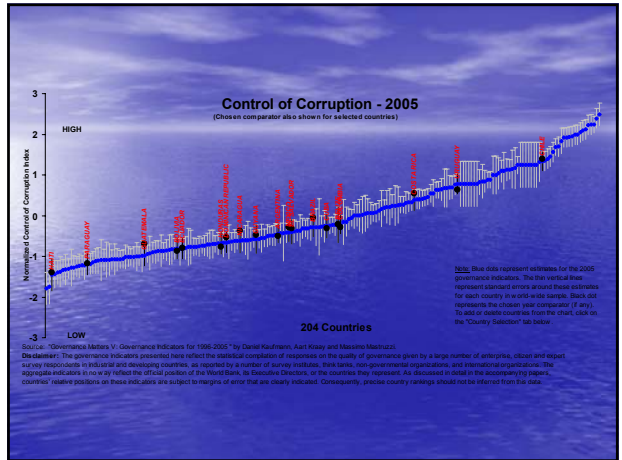
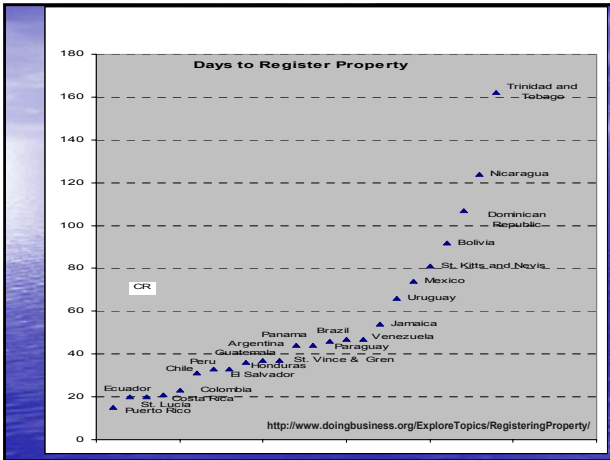
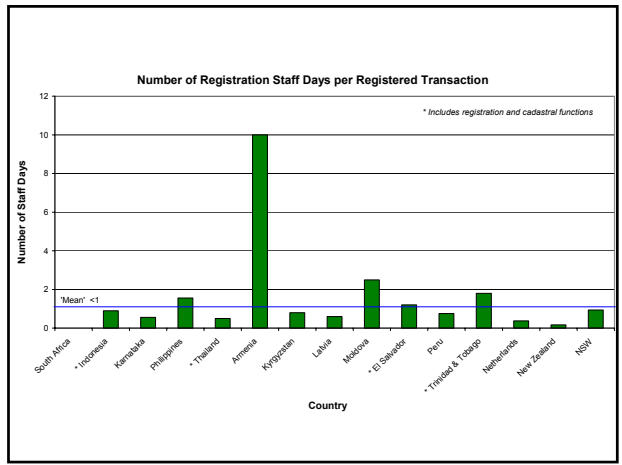
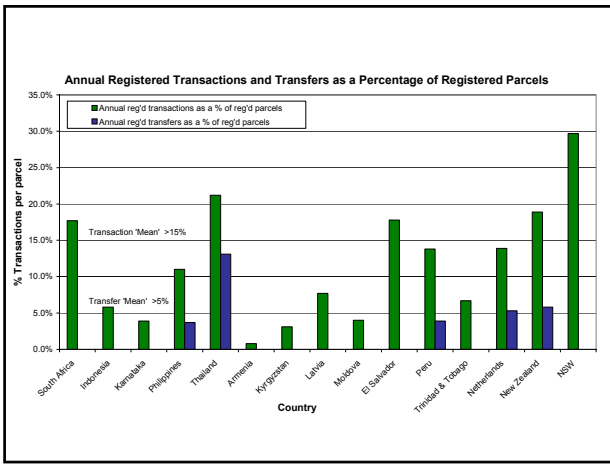
- ## Indicators
- policy/legal perspective:** percentage of country covered by formal rights recognition; level of disputes over land; time taken to resolve land disputes;
 - customer perspective:** number of days; and cost as a percentage of property value;
 - community acceptance/market activity perspective:** number of registered transactions as a percentage of registered parcels; number of registered transfers as a percentage of registered parcels;
 - internal efficiency perspective:** number of registration staff days per registered transaction; annual running costs per registered parcel;
 - sustainability perspective:** ratio of revenue to expenditure.
- Burns et al 2007



	Normal rights coverage	Level of land disputes	Dispute resolution time	Time to register a reg. transfer (days)	Transfer cost as % of prop. value	Annual reg. of transactions as % of reg. parcels	Reg. of transfers as % of reg. parcels	Reg. staff days per reg. transaction	Level of annual running cost per parcel	Ratio of revenue / expenditure
MEAN	100%	low	< 1 yr	< 5 days	< 5%	> 15%	> 5%	< 1	< \$5-\$10	> 1
Ghana	< 2%	high								
Mozambique	< 10%	high								
Namibia		low								
South Africa	80-90%	low				17.7%	5.4%		\$2.70	1.3
Tanzania		low								
Thailand	12-15%	high	3.5 yr					0.9	\$0.70	
Indonesia	5%	high	100%	14	0.5%	5.8%		0.52	\$0.10	2.4
Karnataka		high	2-23	20	13.0%	3.9%		0.52	\$0.10	20.7
Philippines		med	long	14	8.2%	11.0%	3.7%	1.56	\$3.17	0.8
Thailand		low	1	4	4.3%	23.3%	13.1%	3.5	\$2.10	2.1
Armenia		low	1 mths	15	1.3%	0.3%		10	\$49.62	1.6
Kyrgyzstan		low	1 day	10	5.0%	3.1%		0.8	\$17.00	0.8
Latvia	70.4%	low	4 months	3	0.24%	7.7%		0.6	\$7.00	1.6
Moldova		med	long	3	1.4%	4.0%		2.5	\$2.40	
Bolivia	> 20%	high		30		17.8%		1.20	\$27.17	
El Salvador		low		30		13.8%	3.9%	0.70	\$2.17	
Peru		med		4-7		13.8%	3.9%	0.70	\$2.17	
Trinidad & Tobago		low	long	90		0.7%		1.80	\$2.70	

www.landequity.com.au/publications





Resilience

- the amount of change that a system can undergo while still maintaining the same controls on structure and function
- the system's ability to self-organize
- the degree to which the system is capable of learning and adapting (Carpenter et al 2001)

System Identity

- **components** that make up the system (e.g. human actors, habitat types)
- the **relationships** between components (e.g. nutrient cycles, food webs, land tenure)
- the ability of both components and relationships to **maintain** themselves **continuously** through **space and time**

Cumming et al 2005



Flipping Systems in the Amazon



- Thresholds
- Feedbacks
- Non-linearity



Change in Land Admin

- Parcels are subdivided and consolidated
- Parcels change land use
- Owners change hands (sale)
- Encumbrances emerge and disappear (lease, mortgage, lien)
- Owners pass away (inheritance)

A focus on change would mean a prioritization of parcels that are being transacted and changed – those in the land market

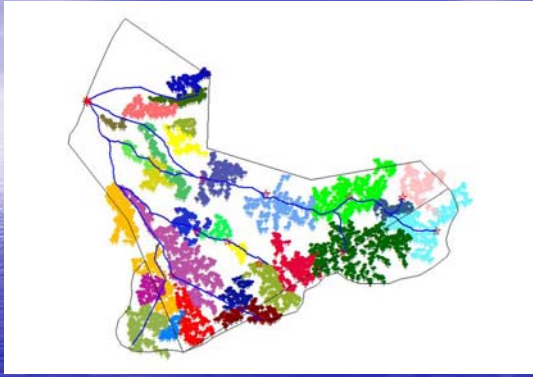
Focus on Radical Change

- Land admin in post-disaster environments
- Stochastic process that changes the status quo
- Resilience can be measured by the time the land system takes to return to pre-disaster status
- Recognize that land system may flip to completely new system – that may be good or bad

Example of Radical Change

“On September 4th, 2007, Hurricane Felix hit land on the Northeast Coast of Nicaragua as a level 5 hurricane. Initial reports have told the story of the eye of the hurricane passing directly over Awas Tingni, resulting in complete devastation of all the homes in the community, as well as destruction of all nearby crops and transport routes.”
(newspaper report)

TREE TENURE VERSUS LAND TENURE



Source: Cronkleton and Albornoz 2007

Social Well-Being



Economic
Development

Environmental
Sustainability