

**A N N E X    I I I**

**LAND INFORMATION SYSTEMS:  
DEMAND, ISSUES AND OPTIONS**



## ANNEX 3

### LAND INFORMATION SYSTEMS: DEMAND, ISSUES AND OPTIONS.

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The following is an annotated version of a paper given by Lynn Holstein at a World Bank Urban Land Management Seminar in December 1989. The Annex incorporates extracts from a recent Urban Management output "Land Information in Support of Urban Development in Developing Countries; Requirements, Issues and Options" (June 1990).

#### WHAT LAND INFORMATION IS DEMANDED FOR URBAN DEVELOPMENT?

1. The most fundamental land information demand in urban development is for multiple purpose mapping, coupled with basic land information standards in support of: infrastructure (utilities, water, electricity, transport, telephone) and engineering; land administration (land valuation, property tax, public and private land management, and legal land registration systems); and natural resource sustainability (requiring environmental and topographic information). Base locational information is needed at the start of development which ideally should contribute to the long term development of an urban information system.

2. The land information is demanded by the many actors in land development and urban management including by: the public land agencies, infrastructure agencies, state and local government parastatals, private sector companies, the real estate professionals, agents, buyers, and sellers.

3. There are three levels of land information required:

- (i) Policy and macro-planning type information;
- (ii) Management and strategy information; and
- (iii) Design, Operations and Maintenance level information.

The information required are differentiated according to the level of aggregation, resolution, and currency required.

4. Policy and macro-planning level information equates in mapping terms with scale 1:25,000 (1 inch on the map equals about 2,000 feet on the ground).



It is required for policy dialogue discussions, macro infrastructure planning, for use in assessing the impact of investment decisions and for macro land use planning. The level of detail required here is two to three street blocks and a currency level of 1-2 years is acceptable. In the late 1980s satellite imagery combined with existing ground survey information, has started to be used for this purpose at costs ranging from US\$2,000 to \$12,000 per city area, depending on what analysis type is required.

5. Management and implementation strategy level information is in the scale range 1:5,000 (1 inch equals about 400 feet) to scale 1:10,000 (1 inch equals about 800 feet). This level of information is required for urban management purposes along with infrastructure and land use planning. The resolution level required here is about half to one city block and little is lost if the information is one year out of date. Aerial and ground survey methods are appropriate means of acquisition with costs of US\$100 per square kilometer being typical (for scale 1:10,000 aerial photography only, maps are extra).

6. Design, operations and maintenance level information is associated with land valuation, property tax, land registration, civil engineering projects, and utility service design and maintenance. Appropriate scales are in the range 1:500 (1 inch equals about 40 feet) through 1:2,500 (1 inch equals about 200 feet). The level of detail required is one street corner or one real property lot. The currency required is such that it reflects the actual situation on the ground - that is less than one to six months old. Base mapping, at scale 1:1,000 and suitable for use in support of multiple uses including infrastructure, land registration and property tax, cost US\$ 3,000 per square kilometer (1988 dollars) in the World Bank's Indonesia "100 cities" mapping project.

#### WHAT ARE THE BENEFITS OF LAND INFORMATION?

7. The direct benefits of improved land information for urban areas are reckoned in terms of improved efficiency of urban management. Better land information may be related to the following benefits: contributes to the potential for more informed decision making; the achievement of greater equity in property tax systems; the potential for improvement of the environment through the sustainability of the natural systems; it contributes to the efficient operation of the property markets through contributing to more secure property rights, and that information is available upon which to base investment decisions; contributes to more speedy approvals in land administration processes (e.g. subdivision approvals); contributes to speedy identification of land ready for development and vacant, thus improving land delivery systems; in allowing land acquisition to be undertaken more rapidly; and in assisting in the improvement of the urban planning process and monitoring.

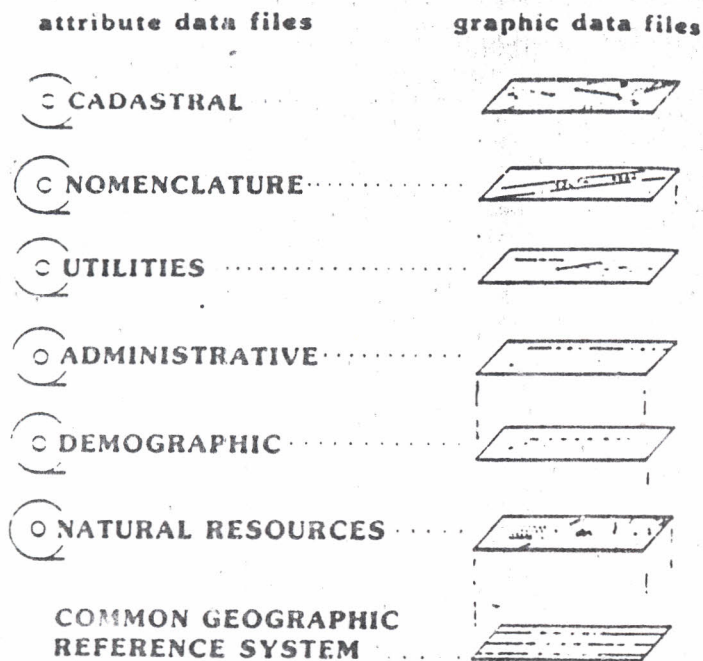


8. Other benefits are in infrastructure operations, up-to-date land information serves as a fundamental tool in support of all services. In underground utility services, land information is necessary for safety and investment protection purposes in association with telecommunication lines, electricity cables, and water reticulation lines. In large cities, damage and accidental breakages of infrastructure services can be expensive in terms of replacement costs, lost opportunity costs especially in financial centers and in the massive disruption caused - satisfactory land information systems can reduce this risk.

**LAND INFORMATION IS NOT JUST MAPS ALONE:**

9. Land information in urban development in the "information age" is not only to do with maps and plans, but is also concerned with the written information about the items on the maps able to be stored about those spatial items - in computer terms - entered into a data base. The map is not an end in itself and can be considered as a "data base" from which an "analyst" - the user - may extract information. To introduce such systems requires an incremental staged introduction over a period of 5-10 years, involving institutional capability, data acquisition and maintenance (up-dating), common standards adoption, and technology introduction. Care is needed here; computerized information systems are demanding in staff skills, logistical support, system design, data gathering; it is not easy. A first stage is usually base-mapping for priority areas in a city; with this base-mapping being the foundation of other layers of information. These layers might be: a real property boundaries layer (a cadastral map), environmental layers, infrastructure layers (electricity services, water and so forth), the property tax layers, etc. (see Figure 1). Each of the layers are maintained in separate agencies though the base information - street names, numbering, dwelling occupier and owner are gathered according to common conventions.

**FIGURE 1 The Conceptual Layer Approach to Land Information Systems**



SOURCE: WALTERS, 1988, SINGAPORE, PROJECT CONSULTANT REPORT



## ISSUES AND QUESTIONS WHICH HAVE TO BE CONSIDERED

10. The issues in land information management for urban areas are complex and multi-faceted mainly because many agencies are involved in its supply while others seek only to use information - demand agencies; coordination is a problem. For many years the industry has been supply orientated with the demand agencies not having their needs met. A demand driven approach should be a goal of land information system establishment.

### Policy Issues and Questions Which Arise

11. In most developing countries there are usually no policies for the provision of mapping, for the supply of land information and its maintenance. In many cases there is usually no nominated agency for urban information, inadequate resources and no agency has a mandate to disseminate information even at a cost. The national mapping agencies in most countries have a rural bias with information in cities accorded a low priority. The policy questions which arise in land information management (LIM) are: What level of decentralization (national state or local government) is necessary? Should large cities have their own land information gathering body? What are the organizational models? What mapping and land information coordination mechanisms are necessary in government? How should district information acquisition priorities be set? What should be the role of the private sector?

### Institutional Issues

12. The most important institutional issues are: the lack of clear mandates for LIM and associated agencies resulting in duplication of effort; many infrastructure agencies undertaking base mapping; the failure of LIM agencies to be demand driven; the security restrictions placed upon availability of land information in many countries constrains economic development projects; and the low profile of the LIM industry. The supply agencies have failed to create the necessary focus for the all agencies to coordinate their urban information system establishment efforts.

13. Questions which arise which must be addressed in developing countries are: how to achieve a demand driven approach to land information supply? What are the organizational models which allow a demand driven approach? How to achieve a land information



service for all regions including large and small cities? How to have a mapping and land information agency serve the basic needs of the demand agencies? What are the coordination arrangements necessary to achieve the long term establishment of an urban information system? How to respect security measures of a country yet achieve the provision of adequate land information for development projects? What incentives are necessary for the private sector to assist in LIM? Where will the leaders come from to solve these important LIM problems?

### Financial Issues

14. The most dominating financial issues are: resource allocation problems between agencies pointing to a real need for cost sharing to achieve objectives; land information management is under-funded with less than 0.05 % of GNP invested in LIM meaning the maps and land information in cities are 20 years out-of-date and only cover part of the city; failure in the past to undertake economic evaluations of land information projects clearly identifying the benefits; and failure to put in place even partial systems for cost recovery.

15. The financial questions which arise are: What percentage of land information should be regarded as a public good -- what percentage allocated for cost recovery? How much should users pay for land information? What is the economic justification of land information? How should the total land information budget available in government be split among the various agencies? Should future LIM projects be justified with cost/benefit analysis undertaken to demonstrate their viability? What mechanisms are there available for agencies to undertake cost sharing with other agencies? How can the infrastructure agencies contribute more directly, financially and technically, to urban information system establishment? What is the fee balance necessary for achieving the greatest usage of land information systems?

### Technology Issues

16. The technology issues are: the high cost of mapping and land information system equipment; the belief that technology implementation is easy (it is difficult) and the solution failing to address the important institutional issues; the failure to maintain the land information resource - maps and associated records up-to-date; and the failure to design systems with maintenance (map and information up-dating) as the most important consideration.

17. Technology questions which should be asked are: What are the best ways for developing countries to prepare themselves for the coming service and industry period (which embodies the so-called information age)? Which level of technology is appropriate? Can there be a technology leapfrog in developing countries or is an incremental approach better? What are the most



cities from the state level (in a federal system of government) or nationally otherwise. Such a city agency would supply the base mapping to other agencies upon which other agencies would base their particular information requirements. The coordination agency would not undertake all city information gathering but would coordinate with the infrastructure agencies and others to allow common standards and information exchange.

21. Institutional arrangements need to be improved with the "land information network" [1] approach recommended to achieve the required cooperation for long term benefits to be attained. This would be supported by the mapping and land information support group. Another more pragmatic approach for the delivery of up-to-date base-mapping could be through one of three groups of demand agencies being: (i) the infrastructure group; (ii) the fiscal cadastre agencies; and (iii) the legal land registration agency. The infrastructure agencies appear best placed to deliver the service capitalizing on their need for current information, their ability (potential) to cost recover for information, and skill levels.

[1] The network approach is voluntary, and consist of each agency being a node in the network. Each agency would collect its own mandated information needed for its functions. It would share discrete parts with other agencies. Some cost sharing would take place. One agency should supply the common base-information.

The private sector should be involved, given incentives, and should be utilized. A LIM support agency should be in place being either at the state or local government level as appropriate, with its primary mandate being coordination.

#### Financial Options

22. Recommended is cost sharing between the demand and the supply agencies, with incentives given to encourage local government to make investment decisions on whether to acquire land information. Some types of land information are in demand and users are prepared to pay for them: new land information management agencies are being established in developing countries both in the public and private sectors and are becoming profitable ventures. Revenue generation methods should be investigated to try to achieve partial cost recovery with the sale of land information products allowed. LIM agencies must set their priorities based upon demand by addressing the real information needs of other agencies. The importance of an economic appraisal of land information system projects is stressed with the benefits clearly identified and if possible quantified.



## Technical Improvements

23. The introduction of technology improvements is recommended based on an incremental approach set in a long-term strategy supported by training and education. Various methodologies are appropriate for each of the management phases of urban management. The "policy and macro-planning level information", will benefit from SPOT satellite imagery. Aerial mapping, using conventional aerial photography, supported by ground completion and checking is recommended for management and implementation strategy level information need. At the operations and maintenance level, aerial mapping and ground surveys are recommended. New technologies can be important in decreasing costs and response times but they are demanding in terms of skill requirements and logistical requirements; several technologies have long lead times during which staff are unavailable for production. A strategy for introduction must be formulated, criteria given for deciding when to introduce such methods, and a staff development plan made. Cost sharing between agencies is suggested as a way to optimize scarce resources in the purchase of expensive equipment especially photogrammetric plotters and orthophoto-machines.

24. **Digital Mapping** A decision should be made as to whether to use digital mapping methods in the project. The criteria for making the decision should be based upon: general agency and country capacity, project demands, the present and future staff skills, logistical support, and will the digital methods form part of the production cycle. The author recommends the "think big, start small" approach, therefore if digital methods are required, start with a pilot project allowing the production work to proceed using manual methods.

25. **Security Restrictions** These mean the use of more expensive and time consuming ground based methods. The author makes a plea for country development agencies to negotiate with their military departments to obtain improved security arrangements for land information for urban development projects.

26. **Standards in LIM** Standards are important and are a necessary first step in the incremental establishment of a "land information network". Standards are necessary for geographical place names, street names, numbering, land-use codes, an understanding of each agency's item definitions, deciding upon a common series of map scales for urban management uses (e.g. 1:1,000, 1:4,000 and 1:20,000); and many more.

27. **Satellite Imagery** Satellite imagery is being used increasingly for urban areas. It is useful for rapid inexpensive spatial analysis of the structures of cities. It should be clearly noted that it is not useful for the purposes of urban land registration, property tax, civil engineering design, infrastructure operations and maintenance.



28. **Geographic Information Systems (GIS)** GIS enable data from diverse sources (eg. satellite, aerial photography, and ground surveys) to be integrated and rapidly analyzed. Skill is needed to undertake this analysis. The greatest cost in GIS is in the data acquisition portion and this amounts to 80 percent of the cost. GIS consist of computer hardware and software, spatial analysis procedures and systems. They have a role in developing countries especially in project preparation and for macro environmental impact assessment of projects. Having said the above, it must be said that GIS is not a simple matter as they demand expertise to be able to take advantage of their power.

### **Education and Training**

29. Education and training should be an integral part of a LIM agency's plan for development and should not be just an ad-hoc addition; it should be linked with manpower planning to avoid the problem of staff with valuable technical training and education being misplaced in other sections of government after valuable directed education and training.

30. Education and training are necessary at all levels of operations in developing countries especially when reforms and technology are being introduced. Ideally, most LIM education should be conducted in the developing countries with overseas experts brought to the country as required; the aim here is to convey knowledge on mass. This in-country approach should be balanced by students being sent to various countries to a variety of institutions for particular skills (including technical, professional and executive) especially management; in this manner a broad based approach is acquired of the subject.

### **CONCLUSIONS**

31. Institutional concerns are commonly the most crucial set of issues to be considered, especially in ensuring that the mapping agency is demand driven with priorities set by the demand agencies. In many cities duplication of information collection is common because of the lack of clear mandates in the urban agencies and want of performance by the mapping agency. The infrastructure agencies in many cases commence undertaking the functions themselves. Military security restrictions upon land information is a severe constraint upon economic development projects especially in the Asia region. The security situation can be improved over time with the development of clear agency mandates, the establishment of what particular land information products are restricted, the creation of the clear release procedures, and the enlistment of such security agencies to undertake new work and the up-date of existing information products. A coordination mechanism is necessary to allow agencies to work together to achieve the establishment of an urban information system in the long term.



32. Financial problems plague mapping agencies -- it is common in development countries that they have no capital accounts and are unable to take on new work. Cost sharing with other agencies is an option. With the investment by multi-laterals in urban infrastructure agencies it is appropriate that support be given to basic urban information gathering upon which others can build. With separate sector funding of each of the infrastructure agencies each one undertakes basic mapping and hand information gathering without reference to each other; duplication results with a huge wastage of resources. There is a need for improved coordination and cost sharing.

33. The most common technical issue at present is whether digital mapping methods (computer-assisted mapping) should be used. The criteria for making the decision should be based upon: general agency and country capacity, project demands, the present and future staff skills, logistical support, and whether the digital methods form part of the production cycle. Digital mapping in several developed countries is more expensive than manual methods. For mapping only the benefit to cost ratio is marginal. The author recommends the "think big, start small" approach: therefore if digital methods are required then a pilot project is a starting point, allowing the production work to proceed using manual methods.

34. Satellite imagery is proving useful in the preparation of urban development projects: it is being used at present in the preparation of several urban development projects. For the majority of developing countries, satellite imagery is best obtained overseas with no necessity for in-country acquisition expertise to be developed.

35. Dissemination and institution building are important and the implementation strategy should allow for the costs of land information product dissemination as well as the training of users in other agencies.

36. A most pressing problem is to satisfy the demand for skilled LIM technical staff and managers. Leadership and foresight are necessary to work with other agencies and to formulate strategies and actions to put into place successful land information systems. Education is crucial in LIM in all parts of the operation including technical, professional and executive.

37. In designing and implementing land information systems several principles apply:

(a) address the immediate development priorities both for the short term project preparation objectives, though contribute to the longer term land information purpose.



1) various levels of detail may be suitable followed by detailed coverage over specific project areas;

2) the priority may be for large scale maps for infrastructure planning and development; or real property information to assist with domestic resource mobilization through property tax system improvement, or an inventory of real estate property rights for land market facilitation.

(b) user requirements are paramount in LIS design -- the design should ensure ease of information product usage and analysis; the concentration should not be on complete coverage and high accuracy cartographic quality information but coverage and time provision.

(c) dissemination strategies for the information products produced should be a major consideration for the information project leadership and training should be available to users;

(d) education and training should be part of the implementation strategy, not only for the information suppliers but for the users of the LIM products.

(e) the future users of the land information should play a leading role in the strategy and design of the systems -- users should be their leaders of the design and implementation stages of LIM development;

(f) the LIM implementation approach adopted should be suitable to the conditions in the country and more especially in the urban areas - the institutional, technical and skills level of the agencies must be matched;

(g) incremental strategies should be adopted which can be improved over time in definite stages to match development priorities and the capacity of the administration;

(h) mechanisms to regularly up-date the planned maps or data bases should be investigated as a first stage of the design; if possible the up-dating method should be transaction based, though as a first stage cyclic up-dating may be all that is possible;

(i) the levels of technology used for the various LIM tasks should match the skill levels and logistical capacity of the country - i.e. a selective use of technology should be used; a list of criteria for technology applicability relates to each task's specificity, predictability, complexity, and its relationship with other tasks. LIM technology introduction should be undertaken and improved over time, but at all stages must be at a manageable level.



EXPERT GROUP MEETING ON LAND REGISTRATION AND LAND  
INFORMATION SYSTEMS

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*See  
annex III*

UNCHS (HABITAT) NAIROBI

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THE ROLE AND IMPORTANCE OF LAND REGISTRATION AND LAND  
INFORMATION IN LAND MANAGEMENT AND DEVELOPMENT

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The Role and Importance of Land Registration  
and Land Information in Land Management and  
Development

INTRODUCTION

This paper identifies and stresses the role of improved land registration and information systems in addressing critical problems of land management and development in the 1990s. The emphasis is on the user of such systems in the urban sector; municipalities, governments, land developers, (individuals, cooperatives, commercial companies) and other actors in the use and control of land.

The paper is based on the ongoing work on land management being carried out by Lynn Holstein, Patrick McAuslan, David Dowall and the author, as part of the Urban Management Programme (UNDP/UNCHS/World Bank).

THE CURRENT CRISIS IN LAND POLICIES

a) Background: Massive Urbanisation:-

The inescapable fact underlying any discussion on urban land development and management in the 1990's is the sheer scale of the urban transition in developing countries. The rate of urban growth is the single most important phenomenon transforming human settlements in developing countries and the need for better management of this growth is critical for governments, local communities and individuals. The world's urban population is expected to increase by some 50% in the period 1985-2000, from some 2 billion to 2.9 billion, and the share of people who live in urban areas in developing countries will increase from 58% to 67% over the same period. More than half of the urban population increase is now the result of natural increase and not of rural-urban migration, and this component of urban growth will strengthen over time. By the year 2025, eight out of ten urban dwellers in the world will be living in urban areas in developing countries. While urban growth rates in developing countries are projected to decrease from 3.8% per year in 1970-1975 to 3.6% in 1995-2000, these rates will still be high and will apply to growing absolute numbers of urban residents.

The benefits of urbanisation are clear. With rapid urbanisation, the economic importance of cities and towns in developing countries is increasing; future national economic

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\* A list of relevant outputs from the Programme is included in Annex I.



growth is increasingly dependent on the ability of urban centres to perform crucial functions within regional and national economies and to lead the country's development effort. At least 50% of GNP in the developing world is now produced in urban areas and the World Bank predicts this figure to rise considerably by the year 2000. Urbanisation is thus a prerequisite for a diversifying economic base which can mobilise and use resources more efficiently, and is thus more capable of generating employment and income on the scale required, given population growth trends.

Rapid urbanisation is likely to result in a doubling in size of built-up urban areas in developing countries in the next 15-20 years. (For example, Bangkok, Thailand covers about 600 sq km and expanded at some 30 sq km annually during the 1974-84 period: Mexico City expanded by some 50 sq km annually in the early 1970s; Jakarta, Karachi and Bogota by some 24 sq km annually in the 1970s.) Such rates of increase in demand for residential, industrial, commercial and community land have few precedents in the history of developed countries.

b) Evidence of the crisis:-

There is mounting evidence of a crisis in land policies in developing country cities in Africa and elsewhere. At the root of the current crisis is the fact that, taken as a whole, governments have adopted policies which have contributed to land shortages rather than facilitating the supply of land. Evidence of the crisis includes;

- land for shelter is too expensive for the majority of city dwellers;
- land ownership is skewed whereby a small percentage of people and government departments own most of the land in urban areas;
- in many cities, land prices are extremely high relative to other commodities and increase at rates higher than that of inflation;
- shelter and infrastructure projects involving land purchase are becoming more difficult to undertake because of the high costs of land;
- inefficient and costly bureaucratic systems for land transfers, insecure property rights, ill-functioning land registration systems and non-operative judicial systems for resolving land disputes limit the supply of urban land and increase the amount of extra-legal settlement;
- the majority of many self employed and/or low-income groups are excluded from access to credit;



- poor infrastructure thwarts industrial, port and commercial development.

c) Reasons underlying the crisis:-

The crisis has been largely brought about by varying combinations of the following:-

- ineffective public sector land development strategies; in particular the generally unsuccessful history of land banking
- irrelevant physical planning; i.e. the failure of comprehensive, technocratic master planning
- inappropriate land use regulations and standards; in particular (a) the failure to attune standards to the real needs and affordability of the majority of residents and (b) the failure to compare the benefits of regulations with the administrative and economic costs of implementing them
- limited infrastructure: in particular the constraint of infrastructure finance and poor coordination between land and infrastructure agencies in enabling land development
- inadequate understanding of land markets; in particular the fact that most municipal governments have very little knowledge about their local land markets compared to the people and business which operate day-to-day in those markets.

Each of these failures in land management and development is worthy of detailed analysis but for the purpose of the present meeting we may concentrate on the fifth constraint, the lack of effective property rights and land registration systems.

d) The growing marginalisation of local government:-

The net effect of these failure is that the majority of urban growth in cities and towns in Africa is now taking place outside "official" land policies and control systems:-

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"The fact that many African countries have, since independence passed various laws concerning land, even laws nationalizing land should not be construed as indicating the existence of a clear policy. What is clear is that most African governments today prefer that land and especially urban land, be held in leasehold of a duration varying between 49 and 99 years. This by itself need not be a deterrent to a vigorous urban land policy, provided that a program is put in place to ensure that this policy is effectively implemented. The truth, of course, is that except for the restricted areas of each city (usually the elite areas of the city) these laws are honored more in



| their breaches than in their observance. In their place, over  
| the greater part of African cities, the adaptive informal  
| system of land transactions and sales involving members of the  
| local land-owning population and the migrant population hold  
| unimpeded, if formally unrecognized, sway. Many reasons  
| account for this situation, all of which require that we  
| examine in detail the relation of policy implementation  
| strategies to the effectiveness of urban land management".(1)

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In the face of rapid urban growth most municipal governments in developing countries have very little knowledge about their local land markets compared to the people and businesses which operate day-to-day in those markets. Visits to the planning offices of most municipalities reveals how little is known about patterns of urban land development, the number of transactions in housing units (both formal and informal), land and housing prices, rents for commercial buildings, land subdivision patterns, and so on. The same criticisms can be made of the commercial private sector as well. Developers frequently over-build markets because they do not have up to date information about prices, affordability, etc.

An increasing proportion of urban population in developing countries relies on informal access to land. Because municipal and central government decision-makers frequently fail to see the need for providing adequate land for housing low income families and small businesses and as low-income families seek to overcome formal government interventions in the land market, there has emerged a dual land market. The formal land market is characterised by land transactions in the "modern" sector, zoning, density and other statutory regulations and a predominantly middle/high income structure. The informal land market is characterised by a variety of settlement types on both public and private land, often organised in a planned and premeditated manner and increasingly subject to control by "middlemen" in the form of unofficial land brokers, subdividers, etc.

Thus, informal residential and business development increasingly dominates new urban areas and is forced to rely on self-help techniques. These range from illegal squatting and tapping of urban services by low income households to the provision of private electricity, water and sewerage services by developers serving high income households. Increasingly, therefore, "traditional" planning activities are restricted to trying to control "unplanned" growth, where possible trying to introduce some development coordination and services to these settlements.

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rom: Perspective on Urban Land and Urban Management Policies in Sub-Saharan African - A.L. Mabogunje, Visiting Research Fellow, World Bank, 1990.



In such areas the traditional paradigm of "planning-servicing-building-occupation" is being replaced by a new paradigm: "occupation-building-servicing-planning". This is a situation in which the much-debated question of public participation in the planning process does not arise. It is the public that does the planning and development; it is the planner who does not, or is not allowed, to participate.

## LAND MANAGEMENT - THE CHALLENGES

### (a) New Approaches to Land Management:-

Four key challenges for the 1990's are:-

- a) The physical challenge - how to improve land delivery systems in order to sustain urban development for all purposes at levels affordable to all or most income groups. Can cities create the resources from the public and private sectors to provide urbanized land at a scale sufficient to keep up with population, industrial and commercial growth while respecting environmental considerations?
- b) The financial challenge - how to develop workable policies and techniques which, at the minimum, recover the costs of providing services in urban expansion areas.
- c) The coordination challenge - how to improve coordination of local and central governments and the various actors in the private sector in the process of land management, clarifying responsibilities for administering land development policies, distributing land rights, regulating land use, monitoring land markets, recapturing costs and coordinating land development with other elements of urban development.
- d) The governance challenge - institutional, technical, cultural, financial, environmental and above all political forces affect decision-making in land management. Unless technical proposals take into account the multitude of existing interests in land and the motivation behind these interests, all but the least radical proposals are unlikely to meet approval. At the same time there is a major challenge in many cities to modify the perspective of government officials towards low income and/or informal settlements. The underlying challenge is massive - how to revive urban governance from its current state of being under-resourced, under--staffed and under-powered.

New directions for land management are urgently needed, centred around the overriding objective of improving the supply of urbanised land. The approach to land development based on a project-by-project approach is now



coming to an end, certainly in the larger cities of developing countries. Instead, cities are now directly confronted with the need to make fundamental policy shifts which can address the four challenges identified. The emphasis on policies highlights the need to reappraise the roles of the private and public sector in land development and management, recognizing the comparative advantage of each in the various aspects of land development.

The shift needs to focus on the following main policy objectives;

- \* increase the supply of urbanised land;
- \* improve the funding of infrastructure;
- \* remove the financial and economic costs of inappropriate land use regulations;
- \* provide basic infrastructure to guide urban development;
- \* mitigate environmental impacts by preventative and remedial actions;
- \* provide efficient land titling and registrations systems.

(b) Implementing the New Approaches:-

The range of possible actions to implement the new policies is wide and will vary by individual country and city according to their level of urbanisation, economic development, historical and cultural traditions of land management, extent of decentralised authority and other factors. The starting point for developing new approaches is to carry out a general stocktaking of the city land market; as a prerequisite for any programme of action. A check list of actions includes;

- \* land market assessments and, where appropriate, initial construction of a land information system;
- \* develop strategies for increasing land supply, using (a) city-wide actions to prepare a land development strategy; (b) area-specific actions such as public land acquisition, land pooling/readjustment, guided land development, use of vacant land, etc.; (c) improving access of low income groups to existing and new urban land; and (d) incorporating informal settlements into city-wide land development strategies;
- \* mobilise funds for infrastructure, using direct sources of public sector funds, borrowing, taxation, user charges contributions in kind and public/private participation in



land development projects;

- \* removing the cost effects of regulations and standards, using a performance criteria approach, as well as permissive systems of development control, better enforcement procedures, etc;
- \* rapid planning and programming of major infrastructure, as part of more effective structure planning approaches to preparing city development strategies;
- \* mitigating environmental impacts, through both preventative and remedial actions;
- \* improving land titling and registration, taking careful account of traditional systems of acquiring title to land, the role of informal settlements and introducing improvements in administrative procedures.

#### CONTRIBUTIONS TO LAND MANAGEMENT BY IMPROVED LAND REGISTRATION AND INFORMATION SYSTEMS

##### a) Introduction:-

The commonly assumed benefits of land registration and information are described in detail in Professor Dale's paper, along with the various deficiencies in such systems. From the viewpoint of urban land management in African cities it is important to strike a cautionary note in the application of registration procedures. Based on such premises we can then identify a core group of benefits which respond to the urban crises and new policies for land management as described in Chapter 3 above.

##### b) Complete or partial reform?:-

Evidence from many countries demonstrates that security of tenure is an essential precondition both for private investment in shelter and for developing a sense of citizenship among city residents. Equally, as already noted earlier in this paper, informal as well as formal markets in land are commonplace in most cities, despite being often clandestine and illegal. Better policies are needed to bring law and administration into line with fact and reality.

In virtually all developing countries, a major stumbling block in the way of the goal of the ideal system of land law is the existence of plural systems of land law. By plural systems is meant customary traditional systems, informal systems operating within popular or unauthorised urban settlements existing alongside the official statutory system which may itself exhibit 'informal tendencies' arising from its inefficient operation. A common assumption is that the way forward is to



reform, i.e. assimilate the traditional and informal systems, into the existing statutory system through government action. A second common assumption is that one of the deficiencies of traditional customary systems is the absence of 'an owner' who can deal with the land, thus preventing its marketability.

There are many pitfalls along the road to assimilation. Lesotho is a good modern example of how reforms encouraged from the outside can go wrong. Zambia is a good example of how reforms proposed from the inside failed the test of political acceptability. Trinidad and Tobago's reforms failed the test of both political and legal professional acceptability. Earlier reforms are bedeviled by traditional 'infiltration'; India, Pakistan and Kenya. Can lessons be learned from the experiences of developed countries which have had to pass through the same phase?

The possible lesson is that significant statutory reform is generally preceded by a long period of evolution which is the product of socio-economic forces within society and that the statutory reform itself must be and be perceived to be in the interests of a significant sector of the population. Thus, in England, evolution of the land laws over three or so centuries was followed by a century of statutory reform culminating in the reforms of 1925; land law reform went hand in hand with the political and economic emancipation of the middle and working classes. Significant reforms of land laws in France began in the Napoleonic era and continued from then on. The German Civil Code of 1900 which provides the basic rule of registration of title in Germany was preceded by earlier legislation and practice from different German Länder. Japanese experience too may be noted.

A major issue of principle seems not to have been resolved by reformers; is a modern statutory system of land law a pre-condition of an effective market in land or is a working market in land a pre-condition of land law reform? Should reform be market-led or government-led? The colonial tradition was for reform to be government-led which is now a contributory factor in much land tenure confusion in Africa, Asia and the Pacific. Some examples where market forces seem to have contributed to the relative success of reforms are Kenya, Thailand, squatter settlements in Zambia and parts of the Caribbean.

Questions may be asked of another standard assumption of reforms; the benefits of title registration. Rowton Simpson has made the valuable point;

"Land registration... is a device which may be essential to sound land administration but it is merely a part of the machinery of government, it is not some sort of magical specific which will automatically produce good land use and development..., it is not even a kind of land reform, though it may be a valuable administrative aid to land reform... Our



study of land registration must clearly distinguish between its public and its private function; the former relates to the welfare of the State or community as a whole, the latter to the advantage of the individual citizen..."

The question is therefore what does the consumer need? It is worth pointing out that rapid urban development in the UK and USA took place without systems of land registration in existence.

The approach most likely to succeed is one which seems to build on existing laws and practices rather than one that seeks to replace them entirely. Mechanisms should be provided to enable land-holders to transfer their land and rights therein from one system to another and incentives could be developed to encourage them down that route. As in Zambia in the mid 70s the benefits of statutory title registration could be extended on a simplified basis to householders in unauthorised settlements. Part of this package however would be a simplified Land Code.

c) Implementation:-

From the urban viewpoint in particular, we may summarize the various considerations needed in reforming or introducing land titling and registration systems as follows;

- (a) systems should be carefully designed in relation to the anticipated benefits, the staff and other resources available, the legal heritage, the requirements of credit agencies regarding the nature of the interest in land being offered as security on a loan;
- (b) improvements should be made incrementally, with a gradual strengthening of institutions and upgrading of recording systems;
- (c) systems will need to take account of intended tenure choices, i.e. use rights, occupancy certificates, full rights, condominium tenure, etc.;
- (d) the wholesale replacement of traditional tenure systems may not be desirable; a more sensitive approach will build on the traditional system and merge it with a modern system over time, thus avoiding the hostility engendered by a too-abrupt change in direction.

Where the State wishes to recognize de facto title to land in extra-legal settlements, the procedures could include; (a) simple basic surveys of land in such settlements, using local knowledge via "adjudication committees" to determine general boundaries and settle disputes; (b) local title registers, in a simple format, to record details of title, etc.; financial incentives such as reduced fees to encourage use of the system;



(d) decentralised land title offices motivated to carry out transactions speedily and accurately.

Other actions may include; (a) development of legal, administrative and financial structures for alternative means of guaranteeing title (e.g. deeds registration, title insurance, private conveyancing); (b) development, if feasible, of specialised dispute settlement mechanisms for handling land disputes; (c) review of all legislation imposing public controls on tenure and transactions (e.g. price control, rent control, etc.) to assess their effectiveness in general, and in particular their effectiveness in increasing the supply of affordable land, and make necessary changes; (d) review and if necessary reorganisation of administrative structure of land offices so as to move towards an integrated and decentralised "one stop" service for the public.

The importance of activating or re-activating a neighbourhood level of action in the process is a key element of a proposal for a "half-way cadastre" made by Professor Akin Mabogunje. A description of the proposal is included in Annex 2.

d) Critical benefits of improved systems:-

Improved systems will contribute to each of the main land management policy objectives described in Chapter 3, but we may concentrate on two:-

o Improved functioning of land markets:-

The immediate benefit is to the improved functioning of land markets. As noted, it is essential for municipal governments to understand and work with the increasing variety of sub-markets in land and housing, both in quantitative and qualitative terms so as to plan for the future development of all income groups. In carrying out such land market assessments, municipalities will need to gather together and analyse a wide variety of location-specific data (land conversion rates, land prices, rental values, role of official and unofficial "actors" in the market, land transaction procedures, extent and systems of tenure, titling, registration, etc.). Such land market assessments can; (a) provide valuable information for public sector planning and decision-making, particularly in relation to informal settlements; (b) evaluate the positive and negative impacts of government policies and actions in land management; (c) help to design more effective land-based taxation systems, infrastructure cost recovery mechanisms, etc. and (d) help private sector investment and development decisions by providing a clearing house for information on land prices, demand, supply, etc.

While there may be a fair amount of information about land from existing maps, cadastres, tax records, etc., the land



market assessment will benefit by using a coordinated land information system. The L.I.S. data base may be restricted at the start to cadastral items (land parcel boundaries) but over time can be expanded to incorporate topographic, registration, utilities, socio-economic, environmental and other data, using relatively inexpensive computer hardware and software to manage a data load with few staff resources.

Access to even the basic cadastral information will help improve the efficiency of recording and transferring interests in land, whether formal or informal. Speeding up land transactions and transparency in information on boundaries, ownership and price will benefit individuals and businesses alike.

o Increasing the supply of urbanised land:-

As noted in Chapter 3, strategies for increasing urban land supply include city-wide actions, area-specific actions; (such as guided land development, land pooling/readjustment, etc.); improving access of low income groups to existing and new urban land; and incorporating informal settlements into city-wide land development strategies. Improved land registration and LIS is of major importance to individuals in terms of security of tenure, certainty of ownership, efficiency in transfer and security for credit particularly where a high proportion of residents are self-employed and cannot offer regular salaries as collateral; to the municipality it offers more efficient identification of urban expansion areas, monitoring of land prices, transactions, supply and demand and easier implementation of land pooling, readjustment, consolidation, compulsory acquisition and other public-private sector initiatives in land supply. Above all, by taking into account the needs of the mass of informal settlement residents, both the municipality and individual residents benefit in terms of improved living conditions, employment opportunities, health and security.

Improved registration and LIS will contribute directly or indirectly to the other main policy objectives. Thus, by providing the basis for the improved assessment and collection of property taxes and assuming there is the political will to collect taxes and update records and assessments, the opportunity arises substantially to increase city revenues at a time when financial resources from central government are static or decreasing. In turn the city will have more capability for initial funding of infrastructure to guide growth, to mitigate environmental impacts of city growth, to achieve more rapid assembly of land for development projects, etc. It should be emphasised at this point that it is critical for households to be able to see the benefits of increased property taxation or similar changes in terms of improved infrastructure and services "on the ground". Programmes of registration, taxation and



improved services should be developed in a well coordinated strategy, therefore.

Lastly, improved security of tenure should be carefully coordinated with more realistic policies, regulations and standards for land use and building standards particularly for low income families. The key element here is an incremental approach, using performance standards which emphasize affordability and the chance to meet politically desirable goals for standards over time.

## 5. PRIORITIES IN LAND INFORMATION

As a concluding note, it is useful to focus on the longer term development of land information systems from an urban viewpoint. Professor Dale rightly emphasizes that land-related information must be treated as a corporate resource that is managed in the interests of all. From the urban viewpoint, the critical factor is the rapidly increasing number, variety and interactions between the suppliers and users of such information. A dilemma may exist for many cities therefore. The increasing complexities of social, economic, financial and institutional interactions in rapidly growing cities points to a widening scope for LIS to achieve more efficient urban management (e.g. the integration of infrastructure, land registration, spatial planning, topographic, environmental and other needs). Yet it is in the city that there exists the most urgent needs to improve basic cadastral and land registration coverage, both to catch up on growing backlogs of work and at the same time to address the needs of informal settlements. The need to establish priorities is given even more urgency by the typical situation of staff and finance shortages in many urban administrations.

How can the political will and commitment to change to increase resources and adopt coordinated strategies for LIS be engendered? Direct approaches to government based on the apparently obvious poor operation of land markets may not work, given the highly political and culturally complex nature of land tenure. Indirect approaches, for example, by identifying the financial benefits of introducing fiscal cadastres, the employment benefits of security of tenure as a basis for credit, the opportunities for community involvement in LIS to lift part of the resource burden on the city's administration, etc. may have more success. In all situations it is important, if difficult, to quantify the benefits of land registration and LIS, (e.g. in terms of additional income to individuals and governments, increases in economic output, increases in revenues, savings in government expenditure by avoiding overlapping functions in surveys, data collection, etc. and by sharing common data among government departments, parastatals and the private sector.

In summary then, institutional <sup>barriers</sup> issues rather than technical problems are the greatest barrier to creating or improving land



information systems in cities. As such, a long term strategy for establishing LIS (10-20 years in many cases) will be the rule rather than the exception. Lynn Holstein emphasises the importance of an incremental approach to LIS (1); "... (The establishment of and information systems) involves a network strategy for agencies working together, at least sharing discrete parts of their information. It is based upon simple concepts of agreeing what are the naming and mapping conventions, and on the linking of land information data-bases held in agencies when the various agencies require. Computer techniques are not necessary from the start but steps should be taken which make the transition to computers easier in the future. A land information network approach should allow agencies to maintain the information for which they are responsible - the property tax agency responsible for property tax information planning information with the development and planning agency and so on. The ultimate theme pursued is that the human resource problem is over-riding, and education and training must form a prominent part of any land information management strategy."

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) See Annex 3 for his summary of urban LI demands, issues and options.



A N N E X I

LIST OF OUTPUTS OF LAND COMPONENT OF  
URBAN MANAGEMENT PROGRAMME



LAND COMPONENT UNDER THE URBAN MANAGEMENT PROGRAMME

INT/86/006

LIST OF OUTPUTS JULY 1990

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- Amos, Jim: "Appropriate Standards for Regulation of Land Use".  
Draft Analysis and Synthesis Report, UNCHS, Nairobi  
May, 1989 (final early August, 1990)
- Amos, Jim: "Appropriate Standards for Regulations of Land Use and Urban Spatial Planning."  
Draft Guideline Framework, UNCHS, Nairobi  
Target date late 1990
- Clarke, Giles: "Land Development Policies".  
Revised A&S-Report, UNCHS, Nairobi  
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- Clarke, Giles: "Land Policies for the 1990's".  
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- McAuslan, J.P.: "Institutional/Le al Options for Land Development".  
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- Peterson, George E. et al: "Multi-Sectoral Investment Planning"  
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- Benninger: "Urban Land Regulations and Development Controls in Maharashtra State India"  
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**A N N E X    I I**

**DESIGNING A "HALF-WAY CADASTRE"**



Designing a "Half-Way Cadastre"

extract from "Perspectives on Urban Land and Urban  
Management Policies in Sub-Saharan Africa"

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Designing a "Half-Way Cadastre"

Clearly, if the current effort at administrative decentralization and strengthening of municipal authority in sub-Saharan Africa is to have any meaning, it must be on the basis that the capacity of municipalities to generate much of the revenue they need to be financially self-reliant is ensured. To do this, serious attention must be paid to providing them with the beginnings of a cadastre, or what has been called a "Half-Way Cadastre". With time, this can be improved upon and brought up to generally acceptable standards. But that should be a long term project lasting over, say 10 to 15 years. It cannot be an immediate goal although it is important to ensure that whatever temporary structure is designed can be easily upgraded to higher standards of acceptability.

In designing a "half-way cadastre", it is important to be clear what the objectives are. Essentially, there are three objectives that must inform the designing and development of a "half-way cadastre". These are:

- the achievement of a total coverage of all identifiable properties in the city;
- the presentation to all the owners (whether individual or corporate) of registration documents to establish their credentials in regard to their property;
- the enhancement of the State capabilities to operate, sustain and update the cadastre whilst also engaged in a continuous process of improvement to bring it to an acceptable standard of accuracy and reliability.



These three objectives are attainable through a creative process entailing a mix of simple technologies, institutional radicalization and minor bureaucratic re-organization. It is necessary to take each of these objectives one by one to show what can be done.

The issue of achieving total cadastral coverage of the city entails distinguishing between existing built-up area and the urban fringe which is still to be developed. The former can be dealt with through a house-listing program; the latter through innovative programs of land development which will be considered in later chapters. The basic logic behind the house listing is the argument that each house stands on a parcel of land which can be assumed to have been individualized, even if this is to a corporate body like a family. To the extent that such structures constitute the basis of the extensive urban sprawl resulting from the rapid growth of cities we must expect that they represent widespread transactions in land.

To put all this on a map quickly, there are, today, various options besides the tedious land surveying techniques. Photogrammetry, with its emphasis on providing the best image quality combined with coverage of the largest possible area per photograph, is valuable but increasingly quite expensive. A recent development in this field, whose value for the rapid production of the "half-way" type of cadastral map is increasingly being appreciated, is provided through the use of the small format microlight survey (SFMS). The SFMS is a low level, localized aerial survey based on the use of an extremely lightweight and inexpensive aircraft (the microlight), recent developments in camera design and easy availability of improved films in both monochrome and color.<sup>5</sup> Details of the operation of the microlights or of the SFMS need not concern us here. What is important is that for a considerably small investment, it is now possible to produce, for most African cities, a first approximation of a cadastre which would provide complete coverage and enable municipal authorities to begin the process of building up much needed urban management information systems.

The second objective is to create a situation in which every property owner has a pre-registration document to establish his credentials in regard to his specific property. It is, of course, common experience that if the existing municipal bureaucracy were to handle this aspect of the process little would be done. This therefore requires re-activating and radicalizing institutions in the city which are best placed to distribute, collect and monitor subsequent activities in connection with the establishment and use of a cadastre. Such institutions should also be part of the process of local state penetration of urban society and of enhancing State social control capabilities.

As mentioned in Chapter 3, every city, whether traditional or modern in origin, tends to organize itself in neighborhoods. A neighborhood is often a smaller territorial unit than the electoral wards in the city such that the latter often comprises a number of neighborhoods. But neighborhoods tend to be of a size that its residents can be a lot more cohesive in action. As such, they provide a basis for ensuring a higher level of involvement and participation in the governance of the city.

In promoting the development of the "half-way cadastre", therefore, neighborhood committees constitute an important institution that need to be revived and radicalized in the sense of performing functions that make them more effective as intermediaries between the grass-roots and the higher levels of the municipal administration. In the particular context of the development of the cadastre, such committees can be expected to perform the following functions:

- explain at the level of the neighborhood the purpose and nature of a cadastre;
- distribute to, monitor and collect the pre-registration documents from all house owners or occupiers in the neighborhood and deliver these to the municipal authority;



- where there are disputes, serve as the first level of adjudicators, without prejudicing the rights of contestants to appeal to higher levels of adjudication;
- perform other functions (e.g. monitoring property tax payments) that may from time to time be assigned to them on agreement with the municipal authorities.

The importance of establishing such an intermediary institution between the urban populace at large and the bureaucracy of the municipal administration cannot be over-emphasized. One of the factors responsible for the lack of observance of most laws or regulations is inadequate State penetration to levels where it matters. Moreover, colonial attitudes die hard in the relationship between the bureaucrats and the public in most developing countries. Leaving the promotion of the development of the cadastre to the bureaucrats alone can thus be a prescription for ineffectiveness as experience to date has shown.

Finally, an important objective of engaging in this "half-way" solution is to begin the process of enhancing State capabilities at the level of the city to create, sustain, update and improve the cadastre until it attains an acceptable standard of accuracy and reliability. The role of neighborhood committees in this regard has already been noted. The expectation is that the chairmen of these committees will relate directly either to their ward representatives in the municipality, or to the council representative in charge of this whole effort, or to the chairman of the municipal administration or to all three at different stages of the process. What is important is that the chairmen of neighborhood committees must be made to feel that they are performing a most vital role in the development of self-reliant capacity to manage the affairs of the municipality.

The provision of so much information to municipal administrations with the concomitant demand for other types of documents from them must put considerable stress on the ability and management capacity both at the municipal and central government levels. The situation must be a major consideration in the new round of technical assistance programs for capacity building in the field of urban management. Data management using the now moderately priced range of mini-computers must be seen as a *sine qua non* for efficient municipal management. This should underscore the need for greater coordination among agencies that have to deal with the issue of land both at the municipal and central government levels. In spite of the multi-faceted nature of the task of developing a cadastre-involving surveying, cartographic reproduction, land registration, land adjudication, property valuation, rating and taxation, it is important to designate one agency (usually the Land Department) as primarily responsible for keeping the records and ensuring that all the other agencies relate to it and inform it of all transactions negotiated through them in respect of any land parcel. One way of ensuring this is to pay attention to the format of relevant documents used by these other agencies and build in a device that necessitates that a copy of any transaction is sent to the primary land agency as a matter of routine.

Capacity building, however, should not be seen simply as a matter of institutional arrangements or of staff development, although both of these are very important. It must also embrace a high degree of quantifiable productivity and accountability. The process involved in the development, updating and use of a cadastre is one that requires dedicated attention from officials in a municipality. Since neighborhood committees are finite in number and their leadership have easier access to the municipal authorities, they can be used as sounding boards from the neighborhoods to monitor the productivity of relevant municipal departments and elicit a higher level of accountability from their staff than hitherto.

The task of improving, on a continuing basis, the standard of accuracy and reliability of the cadastre is, of course, one of providing more detailed survey of the land parcel. This can be a very expensive task especially if each individual land owner were left to provide such survey plans on his own. With the "half-way cadastre" already available to the municipal authority, it should be possible to considerably bring down the cost of producing the plan for each parcel of land by offering each surveyor a large number of parcels to do at a time. Indeed, this could be done on the basis of each neighborhood negotiating an acceptable rate per acre or hectare with the surveyors.