

Applying Low Cost Technology in the Field: Development of the Talking Titler System

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SUMMARY

A number of case studies in different contexts underlie the design of the Talking Titler software system. These include informal settlements in South Africa, customary land disputes and urban land regularisation in Nigeria, post conflict land administration development in Somaliland and First Nations land claims in Canada and elsewhere. A range of data types can be used to provide evidence about land holding, and multimedia data such as video and audio recordings and digital photographs may augment conventional documents such as titles, deeds and survey plans. Nowadays, cell phones can capture all of these data types, and so community members themselves can collect multimedia data. The problem context - unitary, pluralist or coercive –and the complexity of the situation should be understood before data collection commences and continually analysed while data collection is in process. The Talking Titler software has been designed with flexibility as a primary feature; the more complex the situation, the more flexible the database should be in order to model this complexity.

INTRODUCTION

Security of tenure addresses a most basic human need, especially for those on the margins of society. However, tenure improvement strategies should be done appropriately. They should be designed to match the local (perhaps micro-level) social, political and economic situation and be implemented at the appropriate time with a level of technology appropriate to the long term availability of skills and other resources, lest they create uncertainty in an existing stable situation. For example, in cities there is little point in providing secure tenure on the urban fringe if people in this area cannot earn more than the costs of travelling to areas offering economic opportunity. Similarly, officially sanctioned tenure security should be provided to those who want it and in a manner that they can afford the costs associated with the administrative systems which support it; including the costs of conducting officially recognised transactions in land rights. For instance, in a modern form of transhumance, for some peri-urban city dwellers home is a rural village and the city is a place to earn money as part of a multi-faceted livelihood. Thus tenure security in the city may not be of primary importance to them – at least not when they first arrive in the city. Efforts to improve tenure security should not, moreover, extinguish *de facto* interests, especially those of vulnerable people, and place a great deal of power over land in the hands of a few elites – a major risk in land titling programmes.

Notwithstanding the above, developing low cost, efficient, efficacious systems to support land tenure security are of paramount importance in tackling many social problems which are related to access to land. UN-Habitat estimate that some 1.1 billion people live in slums (GLTN 2009). Failure to improve the lives of these people may lead to social and political disturbances. An associated issue is that there are more than 300 million indigenous peoples - people who have retained social, cultural, economic and political characteristics distinct from the dominant societies in which they live - in some 70 countries (UNHCHR 2003). Their land rights should be protected, and perhaps for many of them their greatest risk is when government agencies target supposedly vacant unregistered land as land available for appropriation and development. Much of this land has been used by indigenous people for centuries. In post conflict situations, land grabbing and land disputes may underlie numerous secondary local and neighbourhood level conflicts, and vulnerable groups such as the poor, women, children, the elderly, ethnic minorities and returning refugees are the most likely to be marginalised and lose their land (Barry 2006, Lewis 2004, Törhönen and Palmer 2004, Alden Wily 2004). The number of disputes might be reduced if reliable, generally accepted, and accurate land tenure information is available which was generated prior to the conflict.

Land tenure and other related information (e.g. census data and family relationships data) should be acquired prior to an attempt to intervene in a situation in order to understand that situation and ensure that the intervention is appropriate. For example, a video of a person describing her life history may be part of the information which indicates that trauma counselling or a truth and reconciliation process should be a necessary part of an intervention. Perhaps the same video may be part of the information set which indicates that a significant number of people on the urban periphery live in a city as seasonal workers and that to provide secure tenure for them in the city does not satisfy an innate need.

The paper provides a narrative on how different forms of technology have been applied, may be applied, and when they should not be applied at all, in a number of different complex situations. The primary, higher objective is to contribute to providing land tenure security but at the same time to improve the level of equity, fairness and social stability in land tenure systems. Drawing on the lessons learned, it describes the conceptual design of the Talking Titler system, an information system designed for a number of different land administration and conflict management purposes in complex situations.

The article consists of three parts. It begins with a general description of the different purposes for which information may be required in some of the above situations. It then proceeds with a classification of different types of social problems and the challenges LIS designers and developers face. The second part is a narrative describing field trials and user needs analyses which involved low cost information gathering technologies in a number of different places and contexts. These include an informal settlement upgrade in South Africa, field trials of multi-media data collection in rural and urban areas of Nigeria, LIS development in Hargeisa, Somaliland, and evidence requirements in First Nations land claim cases in Canada. In part three, drawing on these cases, the discussion outlines the conceptual design of a land information system database structure which has the flexibility to deal with significant uncertainty.

INFORMATION AND INFORMATION SYSTEM REQUIREMENTS

More than 150 years ago, Robert Torrens designed a registration system where one of the underlying principles was that the register should mirror the tenure situation on the ground (Dowson and Sheppard 1952). Likewise, a land tenure information system – not necessarily a formal registration system - in an uncertain situation should provide a broad, complete picture of the interests and obligations in land. More importantly, as mentioned above, the system should not unwittingly extinguish *de facto* unwritten rights in land nor place a far greater level of power in the hands of a few elites. Otherwise, the attempt to improve tenure security may actually create conflict (e.g. see Alden Wily 2004). Moreover, in uncertain situations, although there is a need for cheaper land information, it is often necessary to collect information far more frequently than in a stable situation, due to frequent changes in the community or society which is supposed to benefit from the system (e.g. see Barry and R  ther 2005).

The type of information required and the long term usage of the information are also important to consider. Data collection and analysis should form part of an examination of a range of issues prior to an intervention. For example, restoring land to people who perhaps lost it in a conflict or under a repressive political system is an extremely difficult task, and the process itself can stimulate conflict as social and legal boundaries are created or redefined as part of the process. “Winners” gain access to land and resources, and the “losers” are pushed to the margins of benefitting. Another aspect to consider is that in land restitution cases it is seldom sufficient to limit an intervention to merely allocating material benefits. Firstly, community cohesion is very important. If this is not present a return to the land may be wracked by conflict. Secondly, training, trauma counselling, mentoring and an awareness of

the principles of change management and planning are likely to form a critical component of the process (see Barry and Mayson 2000).

The purposes for which information is acquired should also determine the length of time which particular types of data may be considered useful and the level of integration that these data should have with other data types. Is it necessary, for example, to georeference and rectify an aerial image if it is going to be used solely for counting the number of shacks in a settlement? However, could this image be used for another purpose such as determining social networking and support systems and migratory patterns in a settlement as part of a broader data gathering exercise? Could it be used as legal evidence in the future? The question then is: if there are potential additional uses for an item or set of data, should we then integrate this data in an information system?

In general, we can classify our data according to purpose and its predicted term of usage, which in turn determines the sophistication of information management required. As a simplistic generalisation we can identify three forms of data and information management:

- (a) Temporary: Data may be required as a one off collection exercise, where the data are used for a while and then perhaps discarded.
- (b) Flexible: Information technology and spatial information may be used to kick start a process, and thereafter a computer assisted information system may be implemented; the level of ITC then depends on the resources and skills available and may ultimately revert to a completely manual system – until another IT system is initiated. If so, then the risk of losing skilled IT people to better paying jobs and lack of budget or a sporadic/uncertain budget to renew ITC resources and retain trained staff should form a major component of strategy.
- (c) Permanent: A land information system, fully or partially computerised, may be developed.

In reality, other than in a stable unitary situation (defined below), establishing which of the above three forms of information management apply to a particular data collection and storage exercise is not likely to be clear at the outset.

NATURE OF PROBLEMS

Jackson (2003) argues that there are three basic social problem contexts; unitary, pluralist and coercive. Anyone familiar with industrial relations theory and practice will be familiar with these. A further consideration is the level of complexity. A social problem situation, even in the unlikely event that it fits neatly into one of these contexts rather than showing characteristics of more than one of them, will exist on a continuum ranging from the very simple to the extremely complex.

Drawing on Jackson (2003), Finnemore and van der Merwe (1992) and the author's own thinking, in a unitary system, system managers and the participants are assumed to share the same objectives. The problem may be very complex, but everyone can be expected to work towards achieving the common objectives. Goal seeking and viability analysis can be

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expected to dominate the planning of activities. In a pluralist context, it is not assumed that system managers and participants share the same objectives. Conflict is inherent and natural and considered a healthy part of the system. Consensus can be expected to revolve around certain common issues, especially those which are necessary for the survival of the system. Approaches which strive for consensus, at least temporary consensus, and incremental improvement, rather than grand strategies, are best suited to these situations. In a coercive situation, there is likely to be an imbalance of power. Jackson (2006) notes: "Those participants defined as being in coercive relationships have few interests in common, and if free to express them, would hold conflicting values and beliefs. Compromise is not possible and so no agreed objectives guide action." Those who hold the most power tend to direct decisions and adherence to directives is achieved through various forms of coercion. Equity and fairness are likely to feature strongly as external agents' objectives in efforts to improve such a situation.

If LIS designers and implementers fail to take into account the context of the situation, then the LIS development process may well create instability. For example, adopting a linear project management approach to land titling, well suited to a unitary context, in a coercive social situation, may merely entrench an unfair power balance and underlie conflict at a later date. Thus, a broad data gathering exercise should be part of the initial stages of a project: to accurately identify the overlapping interests and to record with some degree of accuracy the different existing and potential areas of conflict. This will contribute to an analysis of the unitary, pluralist and coercive dimensions of the situation. Only when these dimensions are known, should one attempt to model tenure relationships in a LIS.

Furthermore, situations are likely to change, and as they do they may shift between unitary, pluralist and coercive contexts. The data collection and the LIS development processes themselves may influence these changes. However, the overall change in the situation at a particular time may not be the change desired by LIS designers and managers, and a continual monitoring of strategy is advised.

We now move to part two, in which four different case contexts are briefly described which provide context to the above.

CASE: INFORMAL SETTLEMENT UPGRADE, CAPE TOWN

Marconi Beam was an informal settlement that developed on private land in a middle class area of Cape Town, South Africa, during the apartheid era. It was one of a number of case studies which the author started soon after the demise of apartheid. The residents of its approximately 1350 shacks were moved to two nearby formal housing settlements, Joe Slovo Park and du Noon, at the end of the 1990's. The municipality and the landowner did a census in 1994 and drew up a list of people who were to be granted a house in Joe Slovo Park, a housing complex which was to be developed nearby specifically for the Marconi Beam community. In spite of agreements between the community leadership on one side and the landowner and the local authority on the other to limit the number of shacks to 400, the Marconi Beam informal settlement mushroomed from some 109 shacks in 1990, to 1278 shacks in 1994 and 1345 shacks in 1996 (see figure 1).

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According to the agreements with the community leadership, the Joe Slovo Park developer, who was also the Marconi Beam site landowner, planned a housing development of 720 houses which would house more people than originally anticipated. However, even as the site was being cleared more shacks were erected in empty spaces and there was an attempt to reinvade the site once it had been cleared (Barry 2007).

There were existing internal administrative structures developed by the community based on what the Civics movement had developed in South Africa's townships as alternative governance structures in the 1980's. There was a main committee, block committees which reported to the main committee, and street committees which reported to the block committees. The Marconi Beam Development Trust (MBDT) comprising community leaders, municipal officials, the land owner's representatives and land professionals was set up to manage the housing development in Joe Slovo Park and the allocation of houses.

The community established rules relating to access to the settlement, transactions in shacks (sale, inheritance, gifts, one family member replacing another) and the accompanying expected right to a registered plot of land and a house in Joe Slovo Park through debate in mass meetings in which all adult members of the community could participate and vote. In essence the expected right could be inherited, but otherwise the first person into the settlement had priority over those that followed. If A sold a shack to B and C was next in line on the list of people who had entered the settlement after the right to a house had been adjudicated, then C moved up the list of those who were to be granted a house and B's name was added last on the waiting list. Transactions were recorded by administrative staff in the settlement in a notebook and the developer / landowner's agent kept a file for each house in Joe Slovo Park which included the names of the people expected to own it (Barry 1999, 2007).

These transactions were supposed to be updated on the list of beneficiaries generated in conjunction with the municipality and the landowner, but this did not occur. Consequently one of the developer's project managers was unaware of changes that had taken place and proceeded with the housing development project in Joe Slovo Park based on the original beneficiary register (± 400 people). Moreover, there is persuasive evidence that not all transactions were recorded and that the rules relating to shack transactions were ignored in some cases, but this could not be verified conclusively (Barry 1999, 2007).



Figure 1 Aerial View of Marconi Beam informal Settlement Cape Town

To manage the movement of people from Marconi Beam to Joe Slovo Park, a GIS of the Marconi settlement was created by digitising georeferenced, large scale aerial photographs. The first attempt was to move people, area by area, where area boundaries were defined by pathways and roads (see figure 1). However, this system could not be implemented. Factions in the community resisted this scheme supposedly on the grounds that it was unfair, and a lottery system was introduced where shack numbers were drawn out of a hat and the process managed using GIS. As people moved to their house, they were to dismantle their shack, remove the material and the space was supposed to remain vacant (Crone 1997). In terms of the rules agreed between the community leadership and the developer, lodgers - people who rented space in a shack - were supposed to move to the house along with the shack owner (Barry 1999).

However, the recently vacated spaces were soon filled with new shacks, in spite of the agreements between the community leadership and external agents that this would not happen. One explanation was that the lodgers did not move, but stayed behind and re-erected the shack, but this could not be validated and there are probably a range of reasons why the continual infill occurred.

In part, this micro-level continual re-invasion delayed the movement of people to their new houses. Both community members and external agents became angry and frustrated. The developer eventually adopted strong arm tactics by demolishing shacks and moving people area by area as originally envisaged when the GIS was developed and then fenced off the

vacant areas. However, once the site had been cleared some 700 shacks were erected in a further site invasion, and so the developer employed 24 hour security to prevent further invasions.

As the final process of moving people into their houses was taking place, a faction challenged the legitimacy of the process – claiming some people had been allocated a house in Joe Slovo Park unfairly - and intimidated the administrative office staff who then stopped working. Eventually the site was cleared, people moved into Joe Slovo Park, and the surplus people were moved to another settlement called du Noon.

Outside agents who had been involved in the process described their frustration in trying to manage the Marconi Beam project. One senior official asserted that every agreement that they (outside agents) made with the community leadership had been broken. Although the community acted in solidarity in dealing with outside agencies, there were numerous factions within the community which competed for land, power and resources. Faction leaders easily turned the community against the Trust. Intimidation had also been a major problem throughout the development process. MBDT staff, who were drawn from the community, were often intimidated by certain individuals and at times staff were scared to go to the MBDT office. In addition, internal rules and courses of action that were determined by general consensus at general community meetings were also not implemented. One person claimed that one of the MBDT trustees, an elected community leader, sold shack spaces in Marconi Beam, in spite of agreements not to allow people into the area (Barry 1999).

Marconi Beam Analysis

The Marconi Beam story, where the rules were bent, on-site staff were intimidated, and agreements with officials and landowners were not adhered to, was repeated in a number of other informal settlement upgrading cases in Cape Town in the 1990's. However, there were some settlements where the process flowed smoothly and there was a unified community and a unity of purpose between community members, community leaders and external agents in achieving common objectives.

The Marconi case, however, is typical of both a pluralist and a coercive environment. There were a number of different factions competing for power and control over the land tenure system. Community leaders would not, or more likely in most instances could not, enforce the rules.

Thus, one lesson from the Marconi case and other similar cases is that the responsibility and capacity for implementing and enforcing the agreed rules should be established at the outset. If agreements and internal rules are likely to be broken and cannot be enforced, then intervention strategies have to be developed around this scenario. People who invade land do so in the knowledge that they are breaking the law. Why should they then adhere to internally established rules, especially if they are part of the group who do not expect to gain from an upgrading project? In addition, enforcing the rules might require physical force. If community leaders did order the use of physical force, perhaps to evict a relative of a competing faction leader who had erected a shack in contravention of agreed rules, they and those who

performed the action would risk being accused of vigilantism. The leaders would risk losing the next election or face possible impeachment. In addition there is the risk that the competing faction (which could well be involved in some form of gang activities) could retaliate and so set off a violent conflict in the settlement. In another context, it would also be extremely difficult for a community leader to order the eviction of someone of their own extended family, as this might catalyse a family feud.

What was also difficult to understand in the Marconi case was why external agents did not share information. As mentioned above, one of the project managers worked off an outdated register and did not know that the site was not emptying as people moved. He had assumed a unitary situation, in that external agents and the “community” shared common objectives and that the rules which had been agreed about further influx and the movement of people were being adhered to. One can only speculate why this failure to communicate occurred, as the issue was too sensitive to investigate, but the major lesson is that formal and informal systems of information sharing form an important part of these projects.

What emerged from the Marconi and other pluralist and coercive situations in informal settlements, from an external agent’s perspective, is that information should be collected far more frequently than in a unitary situation. Ideally community members themselves should collect census type data relating to who is living in the settlement and transactions in shack ownership, providing it is safe for them to do so. I.e. there is minimal risk of them or their families facing physical threats. In one case of an informal settlement upgrading the project managers also used a digital camera to record shack positions on the ground and posted every transaction on a notice board on site. To protect the records, off site back ups of data e.g. databases or scans of hand written records should be kept (Barry and Rüter 2005).

A further exercise initiated in the Marconi case was to investigate the appropriateness of the formal system of tenure delivered in Joe Slovo Park. This system was one of individual registered ownership with surveyed fixed boundaries. A secondary question was determining what type of education and training might be needed if the system of tenure was deemed appropriate. To test this, discussion groups were set up around a table, some in the street in public view and some in private, where models were used to simulate certain scenarios. For example, groups were asked what would happen if, soon after moving into their new house, a person challenged them and said that they were not the owner of their new house in Joe Slovo Park? What would they do if a neighbour built a wall over their surveyed boundary? How would the rules of inheritance work? The results showed a strong desire to have boundaries that could be re-established to a high precision and some form of official document such as a title or a deed. The responses on the boundaries were compared against as built aerial surveys of similar settlements and a GPS survey of a sample of Joe Slovo Park once it had been occupied (Barry 2007, Barry 1999). It was thus serendipitous that in the case of Joe Slovo Park the appropriate system of tenure was introduced.

CASE: MULTI-MEDIA LAND TENURE INFORMATION IN NIGERIA

What emerged from case studies in South Africa was that where there is a great deal of uncertainty in a situation (e.g. complex-pluralist or complex-coercive situations), conventional

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methods of following a linear progression of adjudication, titling, survey and registration are inappropriate. The problem context(s) need to be understood and continual communication on strategic and operational issues between the different agents is crucial. Moreover, information which captures the uncertainty, importantly identifying the actual and potential conflicts, is desirable. The information needs to be captured with ease and speed. To this end, multi-media data such as videos, audio files and digital photographs were tested in an informal settlement and a rural land reform case in South Africa. In parallel a land information system, the Talking Titler system, is being developed to manage and store this data as well as have the capability to model the relationships indicated by the data. Multi-media data and the Talking Titler system have been tested in four visits to Nigeria between 2006 and 2009 as part of the United Kingdom's Department for International Development (DFID) supported Security Justice and Growth programme run by the British Council, Nigeria.

Nigeria is Africa's most populous country, with an estimated population of 135 million (Index Mundi 2008), and there is immense population pressure on the land. In brief, formal land tenure management is devolved to the 36 state governments. Only 3 % of the land area in the country is registered. In some urban areas, unscrupulous sellers often sell the same piece of land to a number of different people. And, if a person does manage to occupy the land they bought, the "area boys" or "land kings" may extort protection money from them by threatening to demolish any buildings that they erect. Regularisation, the process of getting informally occupied land officially recognised so that it can be registered, is a long and expensive process, and thus people continue to choose alternative, unofficial methods of acquiring land. In some rural areas, as population pressure on the land has increased, land disputes are frequent and violent conflicts are not unknown (Barry 2008).

Years of inept government by successive military regimes and widespread corruption (e.g. see Achebe 1984, Lewis 1996) have contributed significantly to registration and cadastral survey systems falling into disuse in many of the states. This has given rise to what appears to be a thriving racket in landed property. In the cities, many land holders have resorted to painting notices on their street boundary walls such as "Beware of 419, this land is not for sale" (see figure 2) in an attempt to protect their land from being sold over their heads by unscrupulous racketeers. (419 is the section in Nigeria's criminal code relating to fraud).



Figure 2 Notice on Wall to Deter Fraudulent “419” Transactions

Banire (2006) details some of the problems in urban land acquisition and transactions as follows:

- It takes a long time to acquire land as this requires the state Governor’s consent, with many government institutions involved and officials may extort money to get the process moving. The processing of a document of title often takes years so that applications for a Certificate of Occupation – the equivalent of a title or a deed under the Land use Act of 1978 – are abandoned;
- There are costly procedures to acquire land – surveys and a number of different certificates are required. Access to land is difficult for the average person.
- Insecurity of title. There have been grants of the same piece of land to more than one person. A number of land disputes are in the courts.
- Sharp practices in land dealings resulting in nebulous title. The same piece of land might be “sold” to more than one person. Racketeering and the “pernicious role of middlemen” in land speculation. Primarily descendants of land owning families sell to several buyers and at times manipulate the price and the unsuspecting buyer’s title may be defeated by a member of the seller’s family.
- Disputes over Inheritance – for example, in Igbo land, female children are not entitled to a share of the inheritance (i.e. it’s a patrilinear lineage and inheritance system – author), although this custom is in conflict with the Nigerian Constitution;
- Fragmentation of Holdings – customary law allows partition by an individual (e.g. see Nwabueze 1972), but the Land Use Act CAP 202 of 1978 does not;
- Unsatisfactory compensation arrangements – if the government appropriated land under the Land Use Act it has to reimburse the occupier for improvements, but unimproved land can be taken without any compensation.

In addition to the above, Ashafa (2005) asserts that one of the many causes of delays in property administration in Lagos is due to an incorrect survey plan being lodged with the

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regularisation application through error or mischief. For example, applicants use the approved survey plan for property A in an application respecting property B. At times the plan for property B has not been approved by the Surveyor-General. He also mentions the “flying of coordinates”. These are cases where applications involve land under government acquisition or revocation in terms of the Land Use Act of 1978 and therefore cannot be acquired by anyone else, but the UTM coordinates noted on the survey plan “have flown” from a parcel of land that is free from Government revocation or acquisition.

Interviews in this study suggest that although the Land Use Act of 1978 nationalised family land and placed the allodial title in the hands of the state, in cities such as Lagos many land holding families merely ignored it. Video interviews indicated that many of the applicants for regularisation encountered during the course of this project had unsuspectingly purchased government land from speculators and middlemen, some of whom were members of the original land owning families.

In addition, access to land under customary systems in rural areas has become increasingly difficult due to population pressures. There are also numerous territorial boundary disputes between local customary authorities and disputes between holders of communal land within these customary authorities. Customary authority boundaries in the areas which the author visited tend to be defined according to lineage group identity. Boudreaux (2005) documents a case where 53,000 people died as a result of an ethnic conflict which was articulated as being over land and resources.

Improving the quality of governance systems as a general strategy, and in particular land administration systems such as regularisation, survey and registration systems can address much of the above, at least outside of customary areas. However, years of misrule have left some states without the capacity to manage the demand for registration, and the process of regularizing a claim to title and finally registering it is long and expensive. In certain states, the administrative costs can be as much as 50% of the land value (Barry 2008).

Alternative methods of recording the tenure over a piece of land and potentially valuable objects on the land (e.g. fruit trees) may improve some situations. There is an argument that some form of official or private record, which at least acknowledges a claim to land may be an interim measure in urban areas, while people wait for registration (and perhaps a registration system which they trust), which could improve tenure security and diminish the need for landholders to literally paint their claims on their walls (see figure 2). There is also an argument for developing information systems in the long term which incorporate forms of data which accurately reflect what are generally considered fair land tenure practices in customary areas where in most cases western notions of land registration might be culturally inappropriate.

Multimedia Data to Augment Conventional Land Registration in Nigeria

The author examined the usefulness of multimedia data, particularly video clips, and how they can serve as information or be incorporated in an information system, as an ancillary or

alternative system to land registration in Nigeria in four visits over a total of 10 weeks between 2006 and 2009.

Note that data can serve as information without formal incorporation into a purpose designed information system. Nowadays, there are numerous forums for making multimedia data accessible on the internet and other mediums, and so multimedia data can become ubiquitous as technology becomes more readily available in developing countries. Storage and retrieval systems such as the internet also allow competing claims to be publicised, and for vulnerable groups to assert their claims as an international public record if they do not trust the official land record systems.

I discussed and work-shopped the role of multi-media data and other data types and the different possible relationships which can be created to more broadly describe a land tenure system using a prototype of the Talking Titler software system and using data captured in the field in Nigeria with senior officials, politicians, traditional leaders, lawyers, judges, attorney-generals, law academics, land surveyors, surveyors-general, regularisation agents, dispute resolution professionals and other land management role players in the following states: Lagos, Benue, Enugu, Kano, Abuja (Federal level) and Jigawa. Data was also collected from a presentation and discussion at a workshop involving officials, politicians and land professionals from Ondo, Ogun, Osun, Lagos, Ekiti and Oyo states. The software has been licensed to the Lagos State Directorate of Land Regularisation for managing regularisation applications.

Field trials were done in three different places. Videos were filmed, along with audio recordings and still photographs, during urban land regularisation field inspections and adjudications in Lagos (18 individual videos of people who had applied for regularisation were filmed describing how they had acquired their land and why they claimed to be the legitimate owners thereof and two group discussion videos describing the process and what the benefits and risks of the process involved). The second area involved filming part of the process of adjudicating, measuring and valuing land to be appropriated and developed by the state government as the city of Kano expands into a customary area. In the third area, a boundary conflict resolution hearing in the field between two customary local authorities in Benue state was filmed. Once the boundary had been agreed upon through a process of give and take, surveyors constructed concrete beacons at the corners and recorded their location using a hand held GPS.

Nigeria Findings

In brief summary, there are a number of situations, both rural and urban, where applying multi-media land records in Nigeria can contribute to land tenure security. The field trials showed that interviewing landholders about their claims to land may be a rapid and easily understood means of providing data about land tenure. There are a number of other different situations where recording videos may improve the current situation. For example, filming testimony from parties to a land dispute prior to them appearing before a dispute resolution committee or customary court may encourage people to tell the truth. However, some criminal lawyers noted that people may still be liberal with the truth, in spite of being on camera. As a

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response to this observation, to conclude each of the last few video interviews in Lagos, where I filmed and interviewed landholders in front of the land to which they laid claim, I turned the camera on the bystanders who witnessed the interview and asked them if they agreed with what had been said and if they had anything further to add which might be relevant. However, most of the bystanders were themselves regularisation applicants, and so if there were irregularities it might have been in their interests to affirm what had been said in the interview, even if the interviewee demonstrated a liberal interpretation of the truth.

In further discussions on the above, an official, who was also an elder in his own community, noted that what some might perceive as lies may be a cultural issue. The nature of a story might be told according to the status of the person who is hearing it and thus the facts not might appear to be the same when a person tells the same story to different people. This supposition is outside of the author's area of expertise, but warrants examination if a system of videoing testimonies were to be implemented.

Asking for objections or comments should be part of many land use planning processes, and in Lagos this forms part of the regularisation process. However, one official noted that publicising the regularisation of a property in the newspapers had at times encouraged racketeers to try to claim the land. Thus, asking for validation of what has been said in a video interview merely forms part of the quality management process.

In an ideal world, a major advantage of video and multi-media would be that data can be collected in a culturally neutral manner; however this is unlikely to occur in reality. The video includes the visual images which a person is describing and they tell their story in their own language. What is collected in the field can be presented as such, and meaning is not lost in translation or modelling.

I caution that one should take care though that in a coercive situation, the use of video does not merely entrench the position of powerful groups rather than contribute to equity and fairness in the situation, as marginalised people may be prevented from telling their stories. Moreover, a system (e.g. a video testimony system) which fairly and accurately records the tenure system as it should be, rather than a *de facto* situation which is unfair due to fraud or abuse of power, may threaten existing local power relationships, some of which may be related to criminal activities. One can expect groups whose powerful positions are threatened to resist any attempt to change the status quo.

There are a number of concerns over the admissibility of multi-media data in court, fraudulent manipulation or editing of the data, commitment to implementing the system, institutional issues over who should own the data, and the security of data and equipment. Many of these concerns affect all land administration systems, not only ones where aspects of the system have become dysfunctional. Digital data (sound recordings, photographs, digital videos) and film are susceptible to editing and manipulation. The admissibility of digital data as evidence in court is a vast topic and outside the scope of this paper.

However, the field trails in Nigeria suggest that what is of greater concern when using videos is the bias of the person directing the filming process. The interviewer can be selective and

choose not to ask some relevant questions of particular individuals or not film particular physical objects which may be important, and so omit important information. Field trials also showed that you have to be selective and try to form what you perceive to be important as digital videos require a vast amount of storage space. In the field I captured a more complete record by running an audio recorder throughout the entire process, as digital audio files do not use as much storage space as a video.

Overall, technology has advanced to the level that multi-media data are becoming ubiquitous. At present, the technology is not available to many of the poor. However, if information and communication technology become more accessible to the urban poor and rural communities, in the same way that cell phones have become ubiquitous in these areas – and many cell phones can take videos nowadays and many of them have GPS chips- so the potential for multi-media data to contribute to improving land tenure security may be realised.

CASE: HARGEISA, SOMALILAND

Hargeisa epitomises a case where the coercive elements of a system should be considered carefully as part of a land information system development strategy. The overall land administration environment in Hargeisa could arguably be classified as pluralist using the framework developed earlier, because as a society recovering from civil war, Somaliland has made major advances in developing a constitution and institutions to serve civil society. The author spent a month in Hargeisa examining how the land record system might be improved and developing a framework for a land administration development strategy. The use of multimedia data was also explored.

Somaliland, a former British protectorate, unilaterally declared independence from Somalia in 1991, having been ravaged by years of civil war and internal conflict. The capital city, Hargeisa, was bombed during the civil war in the late 1980's, resulting in the destruction of most of the official land records. Land conflicts are the main cause of homicides in the city as vacant land is grabbed and contested by extended families of people who fled during the bombing, as well as new comers and opportunists. The Hargeisa population is estimated at 400,000, of which some 80,000 are internally displaced people (IDP), most of whom have moved to Hargeisa to escape other conflicts in Somalia. There is a sizeable diaspora of Somalilanders who fled the civil war and now reside in Europe, North America and Ethiopia as well as migrant workers who ply their labour in countries in the Middle East.

The diaspora have a significant influence on events in Hargeisa. Firstly, family ties remain strong - Somalis are reputed to be able to recite their clan lineages dating back some 800 years. Secondly, remittances from the diaspora make the greatest contribution to GNP and discussions with Somalilanders indicate that family outside of Somaliland who remit money tend to prescribe how it is to be spent.

There is a plural legal system in Somaliland, as three formal systems of law exist. The primary source of law is the Constitution. Below this are the customary law or *Xeer*, the Sharia, and written secular laws. Interviews indicate that many of the hard copies of secular

laws were destroyed during the civil war, but land administrators continue to follow procedures which were developed in terms of these laws and regulations.

As mentioned previously, conflicts over land in the city are a cause of a significant number of violent incidents, some which result in fatalities. Land vacated by émigrés and supposedly empty land has been grabbed by people moving into the city, government institutions and by émigrés' extended family members. Reducing these conflicts while developing a secure system of property rights, should contribute to social and political stability, and investment and economic growth. An important component of this should be a current, accurate land tenure information system.

The existing paper based land registration system is based on primary registration in the municipal offices and private conveyancing in the secondary market. A landholder applies for a preliminary deed which is created prior to a building permit being issued. If the preliminary deed is not yet on the municipal register, a regularisation process is initiated. Surveyors measure up the site using tapes and annotate the position of the parcel on a rudimentary paper block plan. As part of the survey, they gather oral testimony and documentary evidence supporting and contesting the claim. If the land is uncontested, the preliminary deed is issued and the applicant may then submit a building plan. The owner can then apply for a final deed once the building has been constructed. Only a small proportion of landholders actually follow through to obtaining a final deed. Secondary transactions, e.g. sales, gifts or inheritances, are administered by notaries in a private conveyancing system and the transaction is supposed to be noted in a book in the municipal office. If the land is contested, then the municipality does not issue a preliminary deed until the conflict is resolved.

There are a number of social-legal processes which are used to try to resolve the conflict. The first course of action is to try to get the elders from each party's sub-clan to try to resolve the competing claims. If this is unsuccessful, then a land dispute resolution committee comprising officials may hold a series of hearings in an attempt to resolve it; the case may revert back to the elders and perhaps to further land dispute committee hearings thereafter. Original copies of deeds constitute very strong evidence. Although the municipal land records were destroyed in the civil war, many landholders – including those who are part of the diaspora - had an owner's copy of their deed issued prior to the conflict. However, officials and elected councillors who were members of a dispute resolution committee noted that fraudulent claims using forged deeds and other spurious evidence are not uncommon. If the above does not work, then the case may proceed to the courts. In spite of the above, parties to a dispute occasionally hire private militias in an attempt to secure their claim to land through intimidation. If more than one party does this, then shoot outs may occur between the militias.

At the time of the visit in 2006, the author, after discussion with senior politicians, officials and UN-Habitat staff, recommended that improvements to the regularisation and registration processes should be small and incremental. A systematic regularisation process, rather than the current demand driven one, might stimulate conflicts in a situation where reducing them is one of the municipality's major objectives. For the same reason, filming people providing evidence on camera in the field would have to be done cautiously, and most probably not at all as there is the risk of stimulating a conflict. Filming dispute committee resolution

proceedings could be useful though, as the use of the camera could be agreed at the start of the proceedings. The conflict already exists, and so introducing a camera to film the proceedings is unlikely to stimulate further conflict. The opinions of officials who had been involved in these committees in Benue State in Nigeria, which is wracked by such disputes, are that if what people say can be played back to them, it should encourage them to tell the truth.

UN-Habitat adopted an interesting strategy in developing a GIS to support property valuation and taxation in Hargeisa. Land taxes are desperately needed for the city to function. However, developing the GIS could spark land disputes if it was perceived to be used for determining property ownership.

The municipality made the decision to tax occupancy, rather than ownership. Building outlines were digitised off a colour Quickbird satellite image. Local field staff verified and, if necessary, corrected the plot dimensions by pacing the boundaries on the ground while, in the same site visit, taking digital photographs of the buildings. Office staff incorporated these photos in the GIS. Field staff communicated to home occupants that they were gathering data for taxation purposes and not evidence about land ownership. As mentioned above, collecting ownership information might have catalysed disputes.

The GIS is housed in the municipality, where UN staff assist in running it. My recommendation was that a paper based valuation roll should be run in parallel with the GIS. I.e. implement a computer assisted valuation and taxation system. There are a number of risks associated with such a project which merit this strategy. Firstly, if the UN were to withdraw for any reason, it is unlikely that in the long term there would be suitably skilled people to replace them. Secondly, local people trained on the GIS are likely to be attracted by better paying jobs in the private sector, and so if key people leave the project then it may stop for a while. Thirdly, there is little service support for sophisticated equipment in Hargeisa, and so equipment failures would create long delays. And, fourthly, there is the risk of civil unrest and the GIS data and equipment being destroyed.

Analysing the Hargeisa case, setting out to change the land tenure information system risked increasing the number of land conflicts rather than reducing them. It was a system best improved incrementally. However, the city needs taxes to provide services. The UN-habitat sponsored GIS kick started the process and hopefully the municipality will be able to run the system without outside assistance in the long term. It can be expected that the taxation process in itself may reduce the number of land grabbing incidents as it will be difficult to grab land that is on the taxation register. It would be negligent of a person who has a substantive interest in a piece of land to allow someone else to pay their taxes for a number of years without asserting their interest in the property. However, intra-family disputes or disputes between sub-clans are likely to remain. As a broad strategy, the taxation information system has provided the means to support a significant improvement in land administration, whereas focussing on improving the tenure information system may not have done so. Critical to this was general acceptance of the land tax, as this too can be an unpopular tax and may stimulate undesired land uses (Bahl and Linn 1992).

CASE: FIRST NATIONS LAND CLAIMS, CANADA

Documenting First Nations claims to territory is an important but complex process. The Canadian courts have adopted, from a Western jurist's perspective, a progressive approach to evidence in First Nations land claims.

The Supreme Court of Canada has held that the notion of aboriginal title is unique in law. The laws of evidence, particularly oral tradition evidence, have been adapted to accommodate the *sui generis* nature of aboriginal land tenure. I.e. the law is unique, neither drawing exclusively on Western jurisprudence nor frozen to the traditions as they existed at the time of first contact between aboriginals and Europeans or at the time at which Europeans declared sovereignty over different parts of Canada. Land tenure practices are expected to evolve with time, provided that in claiming aboriginal title, the claimants can be shown to have engaged in practices which are not contrary to their particular culture. One critical question is how those traditions at first contact have evolved and yet remained integral to a distinctive culture as aboriginal tenure systems have changed over time.

In aboriginal land claims cases, the courts have placed oral histories and similar evidence on an equal footing before the law. Judges allocate no greater weight to documentary evidence submitted by government and private land owners than an oral history of an aboriginal elder. A major problem for the courts is how to interpret oral traditions as evidence, as facts and myths may form an integral part of a story; a story which was not originally constructed with the concept of it being used as legal testimony in a modern court. The opinions of experts such as anthropologists and archaeologists tend to be sought to interpret the stories in a manner which is meaningful to the courts (*The Queen v. Van der Peet 1996, Delgamuukw v. British Columbia 1997, The Queen v. Marshall & The Queen v. Bernard, 2005, Tsilhqot'in Nation v. British Columbia 2007*).

A problem is that some of the stories and oral traditions have been lost and continue to be lost. There is a hierarchy within a band and an elder will only tell a particular story to someone who is qualified to hear it. So, the oral tradition is being lost as elders die off and the stories are not being passed on (Barry and Khan 2005).

Some bands are capturing stories on video themselves and using database systems or GIS to store the data. Members of one band indicated that they wanted their own information system, where they held information which was not accessible to the government. Much of the stories have been captured on tape and film by social scientists dating back to the 1960's (Barry and Khan 2005). There's a need to record and organise data for the cultural record, for land claims cases, and for general land administration.

TALKING TITLER DATABASE DESIGN

The four cases described above provide a brief overview of the complexities involved in collecting and relating information in an information system which is supposed to be a tool to improve fairness and equity in access to land and the continued enjoyment of rights and

interests in land. Pluralist and coercive social situations tend to be the most difficult to model, and they are likely to be more complex than unitary systems. The challenge then is to develop an information system design which handles the complexity inherent in the cases described above. As a situation stabilises, the information system may lead to registration or it may merely record a tenure system as it is with no further legal formalisation of individual rights. Outside of registration, the system may be used for land taxation, land claims and conflict management, organisation of cultural records, regularisation management, and general property administration.

In developing a general database model of a land tenure system, referring to figure 3, there are four parent classes or entities:

- (1) Land Objects – e.g. parcels, trees, fruits of a tree, trap lines, water bodies, air space, rights of way.
- (2) Persons – e.g. individuals, legal persons, communities, family units.
- (3) Media Items – e.g. titles, deeds, survey plans, sworn statements, photographs, video recordings, written documents.
- (4) Reference Instruments – e.g. title or deed reference, property file, survey record number, taxation record, conflict resolution file number, housing list.

The above four classes would form the basis of any land tenure information system, be the situation stable or uncertain. Each of these parent classes can be devolved in specialised or child classes pertaining to a specific application. E.g. the reference item can be split into specialised classes such as a survey records system, a land title system or a municipal property file system.

The design challenge is, firstly how do we relate the above classes in a manner which can adequately capture the complexity which may occur in the four cases described above. Secondly how do we describe items of data so that we can still extract meaning from them if that meaning is not addressed by the data model. For example, an oral history might include both myth and fact; there may be a need for a freeform description and interpretation of the data item which records this history. Note that media item refers to actual media items or a description of a relevant activity such as a dance. In the latter case, if there is no record of the dance as a media item, we would use a dummy entry for that record in the database which would incorporate a description of the dance.

To handle uncertainty, it is best to allow everything to be related to everything else. Bohannon (1963) argued that land tenure, the manner in which we hold land, can be modelled by two kinds of relationships (1) person – land relationships and (2) person – person relationships. The person – land relationships refers to relationships such as John (person) owns Lot 1 (land object) and the person-person relationship might include a relationship such as Joan expects to inherit land from John. A third type of relationship exists between different land objects themselves. For example, Lot 1 has a servitude right of way in favour of lot B. If we were to document these relationships, we would have a record of these in some form of media item which might be a written document, a map or perhaps some form of multi-media.

Most land administration systems, in stable situations, tend to work according to a Reference Instrument. A Reference Instrument tends to have a particular administrative purpose; such as a title, a property administration file, a valuation and taxation record, a hunting licence system and so on.

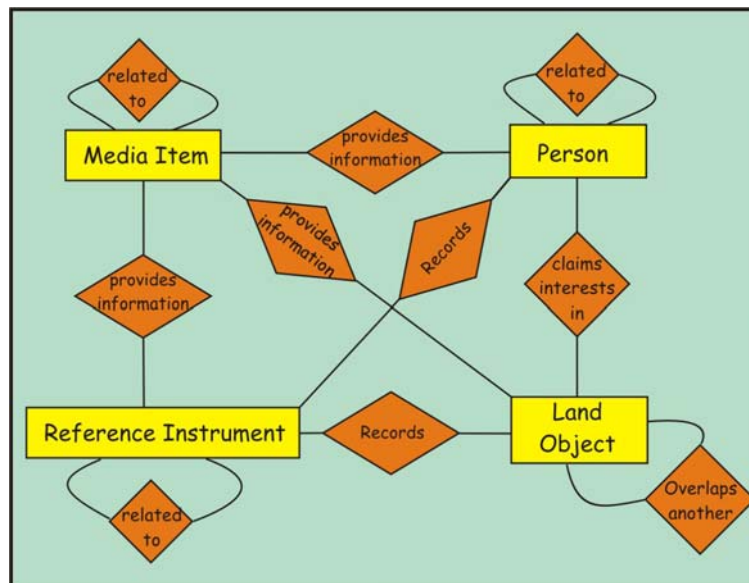


Figure 3 Talking Titler Conceptual Design Entity-Relationship Diagram

If we are certain about our user needs, then the information system design is likely to be designed around the reference instrument in a particular institution. The subclasses would be well known and most of the relationships between items in the database would be one-to-one or one-to-many.

However, in uncertain social and political situations, we may be unsure of our user needs, unsure of the relationships between the different classes and unsure of the different reference instruments that might be used to manage the system. In addition, there may be a host of what to an outsider might appear to be informal relationships, which are an important element of the tenure system. If a registration system falls into disuse, for example, and the titles no longer reflect who the de facto owners are, then we might consider a direct relationship between the person (landowner) and the land object (the lot) (e.g. John owns Lot 1). Then having many-to-many relationships between all the main classes, large freeform descriptions in the tables to describe each instance of an entity and each relationship allows a great deal of flexibility in the system to incorporate data and relationships which might not have been considered at the outset. Thus in figure 3 above, each class can be related with itself and with every other class in many-many relationships.

The downside is that by allowing this flexibility, operator instructions have to be written in far more detail than for most land information system applications. Flexibility allows the operator to create meaningless relationships or omit important relationships. A further difficulty is the data are far more difficult to extract to standardised reports and forms and such like. These

still have to be coded for a particular application. However the latter issue would probably occur with any system designed to handle complex situations.

CONCLUDING REMARKS

In conclusion, there are a range of low cost technological tools available which can be applied in collecting data pertaining to land tenure information, and more and more of these tools are becoming available to the urban poor and to rural communities. Satellite imagery is commercially available at a reasonable cost which offers a sufficiently high resolution for collecting data relating to land occupation. Hand held satellite receivers provide positions to a precision which is sufficient for many land tenure records, and the precision can be expected to improve as new systems come on stream. Field instruments such as lap top computers and hand held computers (personal data assistants) have increased in power and portability. Perhaps the major potential is the number of cell phones in use in developing countries. Nigeria has an estimated population of 130 million people and 30 million cell phone users. GPS chips, voice recorders, digital cameras and video cameras are becoming inexpensive accessories in cell phones. Land survey firms in Canada are using these to communicate between field crews and the office when field crews seek the professional's advice over a boundary beacon position. Cell phones and similar field instruments can be provided to people at the local community level to collect tenure related data. They also provide the opportunity for vulnerable groups to communicate data outside of their communities.

The four cases described in this paper, Marconi Beam in Cape Town, field trials in Nigeria, land administration in Somaliland, and the nature of data on aboriginal land claims demonstrate the difficulties in creating information systems which represent a situation adequately, especially if that situation changes rapidly. The more uncertain a situation, the more flexible the database functionality should be. However, flexibility implies either a high level of operator skill as the system is not as easy to use as a very simple database design, or very clear rules and instructions as to how the system should be used for a particular application.

In conclusion, the four cases demonstrate that the data collection activities and management activities are an important part of creating information which improves land tenure security. However, the manner in which this is done should be designed around the particular situational contexts; unitary, pluralist or coercive. In complex, non-unitary situations, what is most important is that the process is continually monitored to ensure that the main objectives of all the relevant participants around which consensus was originally built, continue to be those objectives, and if not, that land information systems are adapted for any changes. In essence, communication at a variety of levels has to occur continually.

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